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On the Cutting Edge

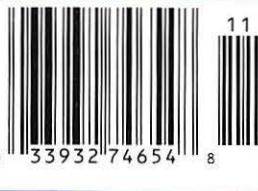
Radio France Internationale
and the Innovative ALLISS Antenna

Also in this issue:

Radio in Cyberspace

Broadcasting Joins the
Information Highway

- ◆ *LF: The Radio Experimenter's Last Frontier?*
- ◆ *Scanning a U.S. Customs Chase!*





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- 250MHz direct count

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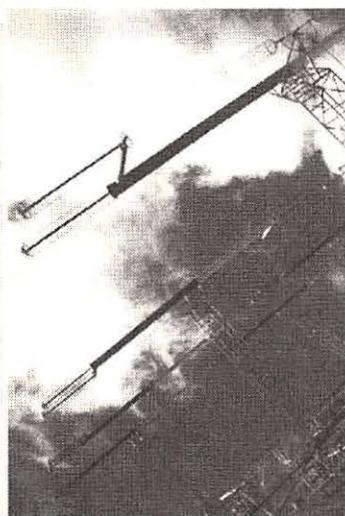
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Vol. 13, No. 11

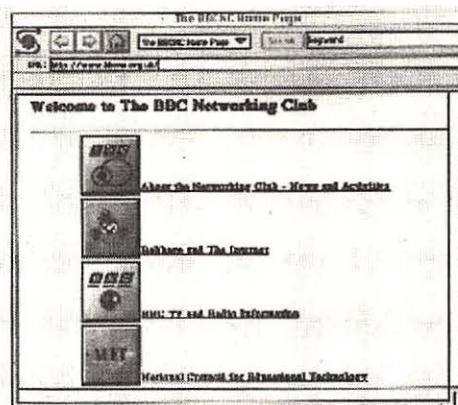
November 1994

**Cover Story**

**The Worldwide Reach
of Radio France
Internationale**
by Jacques d'Avignon

Just when the rest of the world, it seems, is putting all its eggs in the satellite basket, RFI has diversified its approach so that it can reach the world by whatever medium works best to reach the target audience—mediumwave, shortwave, or satellite. It hasn't been an easy 63 years, but RFI continues to follow its mandate: to promote the French language, and to sell France to the world.

In a sidebar story, d'Avignon describes the innovative ALISS shortwave transmitting/receiving antenna developed by RFI's common carrier service, TDF, in partnership with Thomcast. The innovative modular approach of the ALISS could revolutionize shortwave broadcast technology. See page 10.



BBC Networking Club's Home Page on the World Wide Web, a part of the Internet.
Old definitions are becoming obsolete now that you can listen to the "radio" on computer!

LF — The Last Frontier? 16

by Robert Williams

In our youth many of us were dedicated radio experimenters, trekking across the winter air-ways via crystal kits and super-regenerative sets. One place where experimentation and new discoveries are still alive and well is in the 1750 meter band (160-190 kHz, or longwave). Build your own LF receiver and rediscover the thrill of receiving signals from homebrewers just like you.

Radio in Cyberspace 20

by George Wood

The Information Super Highway is coming to a terminal near you. Soon you'll be able to access the world's radio and TV networks, as you DX Cyberspace on your PC. Or—to use the latest buzzwords—let's go "Net surfing on the Infobahn."

Flavoradio 24

by Brian Webb

The Northridge Earthquake was just subsiding. Owner of two communications receivers, Brian Webb found himself without a functioning radio. His preparations for "next time" now include this inexpensive little radio from Radio Shack. In fact, it performed so well, Brian decided to see what else it could do . . .

Tuning in to a US. Customs Chase 28

by Kerry Holliday

You just never know what you might overhear when you tune in to your local police channels . . . !

Aggressive New Motorola Stance 30

by Jorge Rodriguez

Pulling No Punches

Direct Broadcast Satellite systems are the latest rage; but what's the point? asks columnist Ken Reitz. Who wants 500 channels of the programming currently offered at the prices it's currently available? Tune in to the Satellite TV column and see why he's sticking to his old eyesore C-band dish.

Your November issue of *Monitoring Times* brings a cellular mod for the BC855XLT, the winter English language shortwave broadcast schedules, direction-finding techniques and much, much more!



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Address: P.O. Box 98, 300 S. Highway 64 West,
Brasstown, NC 28902-0098

Telephone: (704) 837-9200

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Bob and Judy Grove

Publisher
Bob Grove, WA4PYQ

Editor
Rachel Baughn, KE4OPD

Art Director

John Bailey

Advertising Svcs.

Beth Leinbach

(704) 389-4007

Business Manager

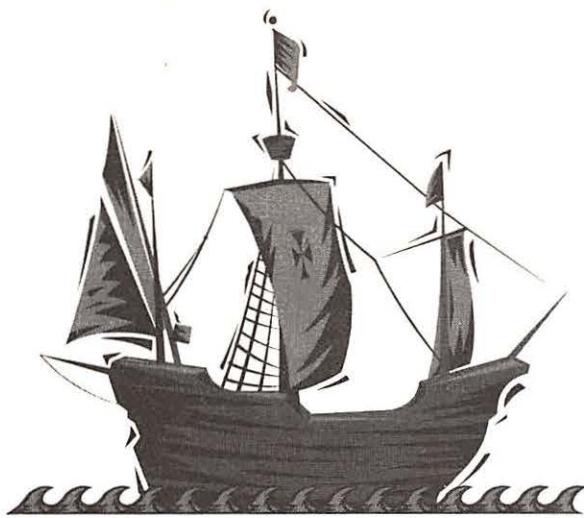
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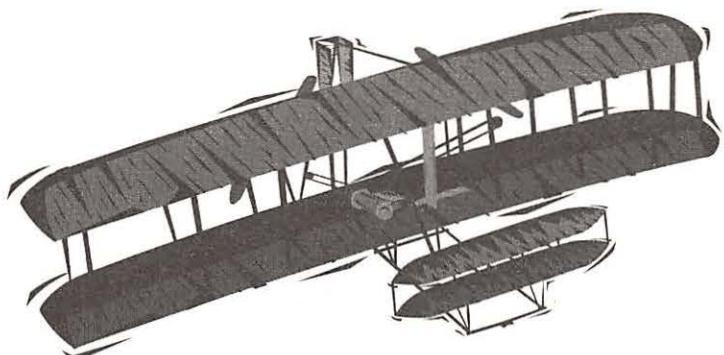
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| Outer Limits ... | George Zeller |

Correspondence to columnists should be mailed c/o *Monitoring Times*. Any request for a personal reply should be accompanied by an SASE.



"THE WORLD IS FLAT"



"THAT THING WILL NEVER FLY"



"THAT ANTENNA IS TOO SMALL TO WORK"

There's one in every crowd—one that pushes the limits and proves the skeptics wrong. The world sailed into a new era of discovery with Columbus. The Wright brothers propelled us into the age of air travel. AEA advances into the ranks of these distinguished pioneers with the IsoLoop 10-30 HF antenna—a 35" loop antenna with low-angle performance that is better than many full-size HF antennas.

One IsoLoop 10-30 HF pioneer offers this: "Big-gun DXers will tell you nothing *that* small can work. They will continue to tell you this after you work a couple hundred countries with it. Ignore them. In 24 months, I have worked 213 countries and confirmed 198."

The reason you get such a big performance in a small package is the efficiency of the IsoLoop 10-30 HF; it's 72% on 20m, rising to 96% on 10m. The main loop serves as an inductor, tuned with a 10,000 volt variable capacitor. Frequency range is 10 MHz to 30 MHz with continuous coverage. The unique

compact design is also ideal if you're facing space limitations—mount it in your attic, on a balcony, or go mobile.

With the optional IT-I Automatic Antenna Tuner (below), tuning your IsoLoop 10-30 HF becomes an adventure in speed—2 or 3 seconds is typically all the time it takes before you're tuned and ready to go. (Antenna comes standard with a manual tuner.)

Discover the world of big antenna performance in a small antenna. Call our literature request line at (800) 432-8873 and request the "Inside Story" on the IsoLoop 10-30 HF or call us direct at (206) 774-5554. For best pricing,

see your favorite amateur radio equipment dealer.



Connect with us



Jacques d'Avignon reports on Radio France International this month from a first-hand visit to Paris. But, it was a lucky happenstance that produced this picture of MT's editor hamming it up with RFI's science reporter ... We were both waiting for the launch of the space shuttle Columbia! For the full report of my impressions as a first-timer at a space shuttle launch—plus articles by two, more experienced shuttle monitors—see the Nov/Dec edition of Satellite Times.

Hot Issues in SW Broadcasting

One of the challenges faced by all broadcasters is how to strike a balance in programming that will attract and satisfy listeners as well as accomplishing the sponsor's (government, sectarian, or commercial) goals. Jeff White of Radio Miami International responds to some of the questions and criticisms the station has received from the hobby press (but not, he says, from his listeners, so far) over WRMI airing the controversial neo-Nazi programming of Canadian Ernst Zundel. Jeff begins, "You correctly portrayed the situation (Oct 'Letters') as a 'First Amendment dilemma.'"

Zundel's status on WRMI will be based on what Zundel says in his programs, says Jeff, not on who he is or what he has said elsewhere. White goes on to address a larger question: "My concern is that if we begin to censor or reject programs because of their content, it could set a bad precedent. One of the problems that exists right now in international shortwave broadcasting is the lack of stations willing to sell airtime; and those which do, are often very selective about what type of programs they will accept. I know from experience that it's not easy to find a station willing to air even a non-political and non-religious program, at any price."

"On the other hand, even though the First Amendment guarantees Zundel the right to broadcast his programs, it doesn't require WRMI or any other shortwave station to broadcast them. (Though we do have a contractual obligation for a certain period of

time.) So the question becomes: Are these programs offensive to a large number of listeners? WRMI has always pledged to be a station run by shortwave listeners for shortwave listeners. So we have perhaps a greater responsibility than most stations to provide programming that listeners want to hear.

"Therefore, we have asked listeners to give us comments about the Zundel programs which are aired on WRMI (Saturday at 1900 UTC in English and Sunday at 1900 in German, on 9955 kHz). ... If we receive a large number of complaints from listeners about any program we air, we will seriously consider taking it off the air. If we don't receive complaints, we have to assume people either like the program or are neutral."

"I know this is an unusual circumstance on shortwave, since most stations are owned by governments or religious or political organizations which only broadcast material that they agree with. So far, WRMI, WRNO, and to a certain extent WWCR are the only shortwave broadcasters in the US (and pretty much the whole world) which are truly commercial in nature, and which offer virtually anyone, anywhere, the opportunity to broadcast their views on international radio."

"Our goal is to commercialize WRMI as much as possible. This is a difficult process on shortwave, as the medium has traditionally been used mainly for political and religious programming. This means that for the time being, many of our 'commercial' clients will be religious and political organizations — and these are two subjects which inevitably lead to controversy. But that's what short-

wave is all about, isn't it? I've been a shortwave listeners since 1972, and I listen because I can hear programming and viewpoints that are unavailable anywhere else."

"For the good of all of us, I think we have to take very seriously this unique degree of freedom of expression which is available in the United States. Balancing freedom of expression and listeners' desires is the sometimes awkward responsibility of a private shortwave broadcaster. We welcome all listener comments on this matter." Address to: Jeff White, General Manager, WRMI, 8500 SW 8 St., Suite 252, Miami, FL 33144. Fax 305-267-9253.

As pointed out in a *New York Times* article by David Binder, where else but on a shortwave station would you find "such loony juxtapositions" as readings from Qaddafi's *Green Book* interspersed with Michael Jackson recordings? Or is that becoming a thing of the past? Given the current climate of re-evaluation and receptiveness to new solutions by broadcasters, the whole radio spectrum is in flux.

Maritime Madness?

This comes from Dick Dillman of Greenpeace out of San Francisco:

"An enormous number of false distress alarms (more than 97%) have resulted from the installation and improper operation of GMDSS (Global Maritime Distress Satellite System) equipment aboard vessels. The situation is so bad [says an article in *Ocean Voice*, the publication of Inmarsat], that *'false distress alerts are severely threatening the continued existence of search and rescue facilities for mariners.'*

"This will come as no surprise to current and former radio officers (among whom I count myself). We have always pointed out that the presence of a single individual with the responsibility for ship's communications is essential to the safety of life at sea. I myself thought the danger was that captains and mates would not be able, through lack of training or the press of other duties, to send a distress message in a timely manner. This would threaten the safety of an individual ship. Now it turns out that inadvertent distress alerts threaten not an individual ship but the entire world-wide organization of search and rescue.

"I understand that the pressures of cost reduction and smaller crews (in itself a safety hazard according to many) probably means the end of the radio officer aboard ship. But it's sad to see that the loss of this individual threatens the safety of ships and crew in a way few of us anticipated."

(Continued on page 114)

Scanners/CB/Ham/Shortwave

C COMMUNICATIONS
ELECTRONICS INC.
Emergency Operations Center

26th Anniversary Special

Save \$30.00
on Bearcat 8500XLT scanner
or RELM WHS150 VHF transceiver.

Celebrate our 26th anniversary with special savings on your choice of a new Bearcat 8500XLT scanner or RELM WHS150 VHF five watt transceiver. This coupon must be included with your prepaid order. Offer valid only on orders mailed directly to Communications Electronics Inc., P.O. Box 1045 - Dept. MT1194, Ann Arbor, Michigan 48106 U.S.A. Coupon expires December 31, 1994. Limit one coupon per item. Coupon may be photocopied. Coupon may not be used in conjunction with any other offer. Credit cards are excluded from this offer. Void where prohibited.

Bearcat Scanners

Bearcat 200XLT-K Radio Scanner

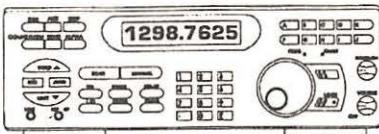
Mfg. suggested list price \$509.95/CE price \$198.95
200 Channels • 10 Banks • Cellular Modifiable
Heavy duty carry case • Illuminated LCD • Search
Size: 2-3/4" Wide x 1-1/4" Deep x 7-1/2" High
Frequency Coverage: 29.000 - 54.000, 118.000 - 174.00, 406.000-512.000, 806.000 - 823.9875, 849.0125 - 868.9875, 894.0125 - 956.0000 MHz.

Recently, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. The Electronics Communications Privacy Act prohibits the intentional interception of cellular telephone transmissions. Supplies of scanners that are capable of being easily modified to receive full 800 MHz. coverage such as the Bearcat 200XLT are in critically short supply. Today could be your last chance to buy your Bearcat 200XLT scanner. Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, depend on the Bearcat 200XLT handheld scanner to intercept just about any radio transmission. You can also program frequencies such as police, fire, emergency, race cars, marine, weather, and other broadcasts into 10 banks of 20 channels each.

A modification sheet with instructions to restore full 800 MHz. coverage for our Bearcat 200XLT or Bearcat 2500XLT may be ordered for \$8.00. To order your Bearcat scanner, call 1-800-USA-SCAN.

Other Bearcat Scanners

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| Bearcat 8500XLT-K base/mobile | \$368.95 |
| NEW Bearcat 3000XLT-K handheld* | \$379.95 |
| Bearcat 890XLT-K base/mobile |\$228.95 |
| Bearcat 855XLT-K base |\$148.95 |
| Bearcat 760XLT-K base/mobile |\$198.95 |
| Bearcat 700A-K info mobile |\$148.95 |
| Bearcat 560XLA-K base/mobile |\$83.95 |
| Bearcat 220XLT-K handheld |\$228.95 |
| Bearcat 200XLT-K handheld |\$198.95 |
| Bearcat 178XLT-K base/WX alert |\$133.95 |
| Sportcat 150-K handheld |\$178.95 |
| Bearcat 148XLT-K base/WX alert |\$88.95 |
| Bearcat 120XLT-K handheld |\$148.95 |
| Bearcat BCT2-K info mobile |\$138.95 |



Bearcat 8500XLT-K Radio Scanner

Mfg. suggested list price \$689.95/CE price \$368.95
500 Channels • 20 banks • Alphanumeric display
Turbo Scan • VFO Control • Priority channels
Auto Store • Auto Recording • Reception counter
Frequency step resolution 5, 12.5, 25 & 50 kHz.

Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage:

25.000 - 28.995 MHz. (AM), 29.000 - 54.000 MHz. (NFM),
54.000 - 71.995 MHz. (WFM), 72.000 - 75.995 MHz. (NFM),
76.000 - 107.995 MHz. (WFM), 108.000 - 136.995 MHz. (AM)
137.000 - 173.995 MHz. (NFM), 174.000 - 215.995 MHz. (WFM),
216.000 - 224.995 MHz. (NFM), 225.000 - 399.995 MHz. (AM)
400.000 - 511.995 MHz. (NFM), 512.000 - 549.995 MHz. (WFM)
760.000 - 823.9875 MHz. (NFM), 849.0125 - 868.9875 MHz. (NFM)
894.0125 - 1,300.000 MHz. (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include **VFO Control** - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. **Counter Display** - Lets you count and record each channel while scanning. **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. **20 banks** - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.

CB/GMRS Radios



A National Weather Service (NWS) receiver with automatic emergency broadcast activation has been added to the legendary Cobra 29 CB radio. The integrated NWS receiver in the Cobra 29LTDWX will automatically activate to receive emergency announcements about severe weather and travel conditions. A special tone-alert signal broadcast by the NWS activates the weather receiver and overrides any CB radio reception for monitoring the warning message.

Cobra 29LTDWX-K CB/Weather Alert ..\$129.95

Cobra 2000GTL K SSB Deluxe CB Base ..\$389.95

Cobra HH40-K CB 40 ch. Handheld\$99.95

Uniden GMR100-K GMRS Handheld\$159.95

Uniden WASHINGTON-K SSB CB Base ..\$189.95

Uniden GRANTXL-K SSB CB Mobile\$139.95

Uniden PRO538W-K CB & Weather\$59.95



Weather Stations

Now you can be your own weather reporter with the Davis Weather Monitor II. Our top-of-the-line weather station combines the most advanced weather monitoring technologies available into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Push a button, and read indoor and outdoor temperature, wind chill, humidity and barometric pressure. Our package deal includes the ultra high resolution 1/100 inch rain collector part #7852-K, and the external temperature/humidity sensor, part #7859-K. The package deal is order #DAVII-K for \$479.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$139.95, you'll have a powerful computerized weather station on an incredible price. For the IBM PC or equivalent order part #7862-K. Apple Mac Plus or higher including PowerBook, order part number 7866-K.

The Weather Monitor II (7440-K) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC-power adapter, detailed instruction booklet and one year limited factory warranty.



| | |
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| Davis Weather Wizard III 7425-K |\$154.95 |
| Davis Remote Display Unit 7815-K |\$84.95 |
| Davis Rain Collector II 0.01" 7852-K |\$59.95 |
| Davis Rain Collector II 0.2 mm 7852-M-K |\$59.95 |
| External Temperature/Humidity Sensor 7859-K |\$99.95 |
| Davis Anemometer Mast Mount 7890-K |\$15.95 |
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| Weatherlink Software for Apple/Version 3.0 7866-K |\$139.95 |
| 4-Conductor 40' (12.2 m) extension cable 7876-K |\$17.95 |
| 6-Conductor 40' (12.2 m) extension cable 7878-K |\$21.95 |
| 8-Conductor 25' (7.6 m) junction box cable 7880-K |\$14.95 |
| 8-Conductor 50' (15.2 m) junction box cable 7881-K |\$24.95 |
| 8-Conductor 100' (30.5 m) junction box cable 7882-K |\$44.95 |
| Modem Adapter 25-pin for communications port 7870-K |\$9.95 |
| Car/Boat/RV Lighter Cord 7873-K |\$9.95 |
| 2400 baud modem for Weatherlink MEXT-K |\$9.95 |
| Weatherlink language disks: Francaise, Deutsche, Italiana, Espanola 7863-K\$24.95 | |

Other neat stuff

| | |
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| Grundig ST100-K portable shortwave receiver with 512 memory & AC adapter |\$389.95 |
| Grundig Yacht Boy 400-K digital portable shortwave receiver - 40 memory presets |\$199.95 |
| Grundig Yacht Boy 230-K portable shortwave receiver |\$139.95 |
| Sangean ATS800-K portable 20 memory shortwave receiver |\$169.95 |
| Sangean ATS804-K portable shortwave receiver w/AC adapter - 9 memory presets |\$148.95 |
| Sangean ATS808-K portable 45 memory shortwave receiver |\$159.95 |
| Sangean ATS808-K portable 45 memory shortwave receiver with cassette recorder |\$209.95 |
| Uniden EXP9200-K 900 MHz 2 line cordless phone |\$289.95 |
| Uniden EXP9200-K 900 MHz 2 line cordless phone |\$269.95 |
| Cobra CPI-900 900 MHz sport spectrum scanner |\$249.95 |
| Bogen PR0018-K memory expansion module, double recording time to 36 minutes |\$79.95 |
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COMMUNICATIONS

Satellites and The Great Satan

Every country needs an enemy. It gives a people something to rally behind. If there is no enemy, one is often created. In Iran, the enemy is the West.

Iran continues to frame almost its entire existence in terms of an ongoing war against the United States. According to Iranian clerics, the U.S. first conducted a military campaign against Iran

(which they say it lost), then a "political" war, and an economic war (ongoing). Now, they say, the Great Satan has embarked on a cultural war.

Western satellite-delivered TV shows, says Ayatollah Mohammad Emami-Kashani, have been a psychological and spiritual blight on the youth of Iran. "Many of our people have had life drained out of them by these programs; they have become wretched and lost their mental balance."

Against this official government position are reports such as the one carried by the opposition Voice of the Mojahed. In Tehran's Ekbatan district, they say that residents angrily turned away government officials who had come to forcibly confiscate their satellite dishes. A short time later, the police arrived on the scene and opened fire. Fighting continued until midnight and several people were arrested, although there were no reports of casualties.

On the always-present other hand, Iran apparently feels no compunction about exporting *its* culture. It just signed an agreement with Albanian Radio-Television in which that country will act as an international "bridge" for the broadcast of Muslim religious programs.

Another Network Ray Victim

A 46-year old Charlotte, North Carolina, man, convinced that the three TV networks were sending "rays" through his TV, decided to take matters into his own hands. William "Manny" Tager bought a used Ford Taurus, and headed north. Along the way, he stopped for a haircut and a Chinese-made AK-47.

Arriving in New York City, he made his way to the street-level, glass-enclosed studio of the *Today* show and tried to enter. A security guard, spotting the rifle, slammed the door in Tager's face, but a stagehand, trying to flag down a police car, was fatally shot in

the back. Police arrested Tager without incident.

Tager said that ABC, CBS, and NBC had been watching him for 20 years, bugging his home, tapping his phone and sending rays through the TV set. The dead stagehand, he said, was a "network goon."

Breaker, Good Buddy

A long-standing disagreement between two CBers led a 66 year old Pennsylvania man to open fire, killing one person and wounding another. According to reports, Russell Hryhor and Davis Brungard were talking on the radio when Marvin Ross—also known by the "handle" of "Brooklyn 99"—broke in and started arguing with Hryhor. Those monitoring the conversation said Ross accused Hryhor of theft and welfare fraud. Hryor suggested that they meet to iron out the matter and gave Brooklyn 99 his home address.

The three met and the dispute escalated when Hryhor demanded an apology from Ross. Ross responded by saying, "I don't want to hear your s---" and opened fire with a handgun, killing Hryhor and wounding Brungard. Brungard, bleeding, was able to return to his car where he attempted to ram Ross's vehicle. At least one of the vehicles ran over Hryhor's body as they fled.

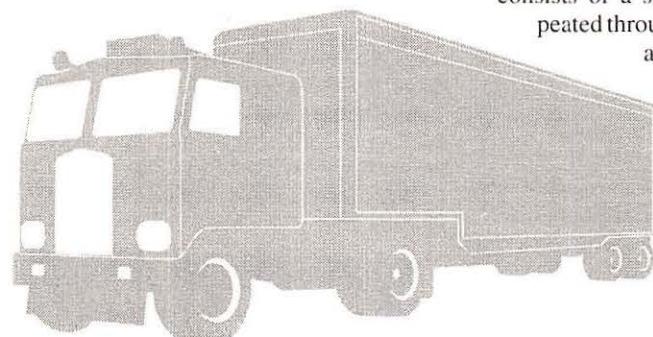
Ross is being held without bail and is charged with first and third-degree murder.

CB Send-Off?

David Carroll was a long-haul North Carolina trucker whose marriage was falling apart. At 32, Carroll had just separated from his wife and three daughters.

One day, he pulled his rig into the parking lot of a convenience store and parked. Contemplating suicide, he took a gun from under the seat. Police, alerted by bystanders, arrived at the scene.

Unable to get Carroll to accept a cellular phone, police negotiated with the trucker by CB. Carroll's wife and kids soon came, trying



desperately to convince him to give up the gun. But as police and family members worked, they were continually harassed by passing truckers on nearby Interstate 40 who taunted Carroll, sneering that he didn't have the guts to pull the trigger.

Carroll did. He died at 1:25 pm after a three-hour stand-off.

"I guess they thought they were being funny," said an officer at the scene. "Maybe they thought this guy wasn't serious. It turned out he was."

Hoaxer Ordered to Pay Restitution

A Neah Bay, Washington, man who led the U.S. and Canadian Coast Guard on a wild goose chase in 1991, has been ordered to pay \$17,000 in restitution.

Steven Lee McCarty pled guilty in June to transmitting a false distress call. In April of 1991, McCarty broadcast a call for help, saying that his vessel was sinking. He repeated his charade for over an hour, and both U.S. and Canadian forces were deployed.

Restitution will be divided between the two countries with the U.S. Coast Guard receiving \$6,783 and the Canadians getting \$10,305.

Sending a hoax distress call is a felony punishable by up to six years in prison, a criminal fine of up to \$250,000, and a \$5,000 civil fine.

The Little Station That Could...

Just about every radio hobbyist I've met would love to own his or her own radio station. The most obvious obstacle is always money—stations aren't cheap to buy or start.

In Freeland, Washington, that's not stopping David Ossman and Dick Mahan. Seven days a week, 20 hours a day, their Whidbey Information Radio is on the air—but only for people waiting to board the ferry in Mukilteo. Broadcasting at one-tenth of a watt, station literature says that its signal is "strong and clear for only about as far as you can sideward a clam."

The station went on the air in January on 1610 AM and 102.1 FM. Its entire broadcast consists of a single half hour program, repeated throughout the day. The program is

a mix of interviews, features, and whatever else strikes station personnel's fancy.

Station officials admit that their operation is small. Says Ossman, "What I think is that we are the first Burma Shave signs on the information superhighway."

COMMUNICATIONS

Little Station II

Last summer, Danny Buch, vice president of promotions for Atlantic Records, had an idea. Every day, thousands of commuters sat in traffic outside the New Jersey side of the Holland Tunnel.

This is a captive audience, thought Buch, of massive proportions. Some 1.9 million people use river crossings each day to get to the island of Manhattan and virtually all of them spend some time sitting in their cars going nowhere.

So Buch planted a low-powered AM transmitter at a nearby gas station and half a dozen interns wearing sandwich boards advertise the frequency outside the entrance to the tunnel. Commuters who listened to the broadcast were treated to music by one of Atlantic's new bands, B-Tribe. After the tunnel broadcasts began, B-Tribe enjoyed a 19 percent increase in sales "and there's no other place that could have come from. Where we can go with this is pretty staggering," says Buch.

Atlantic is looking to establish stations at other New York City tunnels and bridges and may begin using the idea in other cities.



Costs Motorola Millions

Prosecutors in Oklahoma have issued a federal arrest warrant for John David Astacio, a 41 year old "computer wonk" who is accused, among other things, of reprogramming Motorola radios so they can pick up "restricted" police and fire channels. When police raided Astacio's employer, Tulsa Security Patrol, they found software that could be used to reprogram the radios. Motorola had an attorney present at the raid. Astacio is currently missing. Tulsa Security Patrol owner Larry Gass is apparently also under investigation.

According to local newspaper reports, the reprogrammed radios were used by "media organizations and others." Sgt. Rod Hummel of the Tulsa Police Department said that police fear that the radios could interfere with communications between officers and could knock out the city's radio system.

Pat Schod, a Motorola spokeswoman, said illegal use of Motorola software had cost the company "millions of dollars." Motorola, she said, has won civil lawsuits to recoup money lost by such pirating of its software.

Motorola is also on the move in Florida where a federal judge ordered 25-year-old Francis Harris to stop altering Motorola ra-

dios. Motorola claimed Harris was using copyright and trade secret information so that he could monitor "secret" law enforcement communications. Harris says that the data, codes and equipment he uses are available on the open market and that Motorola's action is an effort to censor the 1995 edition of his book, *Frequency and Intelligence Directory* (see p.30 for more on this story).

Buying Beeb History

Looking for a solid investment opportunity that'll also give you a piece of international radio history? Three of the BBC World Service domestic relay frequencies in New Zealand are for sale.

Auckland's 1386 channel, Wellington's 1233 kHz, and the Christchurch 1017 kHz channels are apparently going to the highest bidder.

It has been reported that although the channels carry the BBC, they are in fact privately owned. Serious inquiries, however, could probably be initiated through the British Broadcasting Corporation in London.

Watch Your Mouth

The *Wall Street Journal* now says that bar associations in at least five states have cautioned their members that attorney-client confidentiality may be breached if they don't watch what they say on their cellular phones. "It's only a matter of time before a client will have a [legal] claim against a lawyer for disclosing something [over a cellular phone] to the client's disadvantage," says William Freivogel, vice president of Attorney's Liability Assurance Society.

Savvy companies have long been alert to the dangers of inadvertently disclosing business intelligence over a cellular phone," says the *Journal*. In March of 1990, it reports Peter Lynch, the mutual-fund executive in Boston, was overheard talking about his forthcoming resignation on a cellular phone. In 1988, a listener overheard the chairman of Popeye's Fried Chicken disclosing plans to take over rival Church's Fried Chicken.

Still, because it's illegal to eavesdrop on a cellular conversation, any information gleaned about a lawyer or a client in that manner wouldn't be admissible in court, or any other legal proceeding, according to the *Wall Street Journal*.

The most plain-English assessment of the situation came in an in-house memo circulated at the DuPont Com-

pany. It says, "If you don't want your conversation printed in the daily newspaper, then avoid using a cellular phone."

"Communications" is written by Larry Miller from material supplied by the following staff of reporters: Nigel Allen (via Roger Cravens), location unknown; David Alpert, New York, NY; Harry Baughn, Brasstown, NC; M.L. Cauthon III, Bremerton, WA; David Chapchuk, Scranton, PA; Peter Eskay, Los Angeles, CA; John Henault, Brooksville, FL; Stephen Kaatz, Huntington Woods, MI; Fred Kelly, Jr., Houston, Texas; Gene Sawyer, Temecula, CA; Marvin Schmeal, Tellington, AB; Lou Shirley, NJ; Richard Sklar, Seattle, WA; Dan Stork, Tamarac, FL and Philip Yasson, Portland, OR.

Thanks for the near record turn-out, folks! Other publications quoted include the Associated Press, *National Scanning, Satellite Times, Wall Street Journal, World Broadcast Information* and *W5YI Report*. You, too, can join the Communications monitoring team by watching your local newspaper for stories about radio. Send them to Larry Miller, *Monitoring Times*, Communications Department, P.O. Box 98, Brasstown, NC 28902. And thanks!

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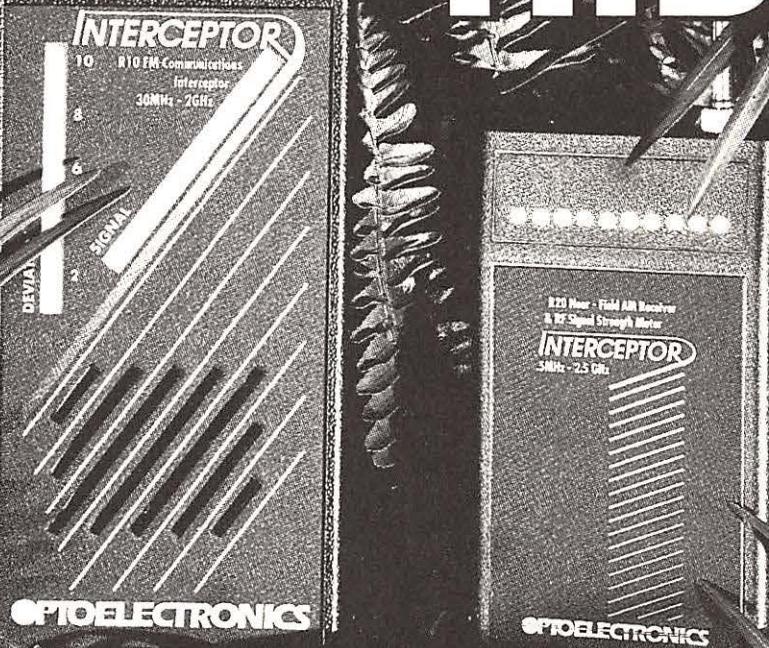
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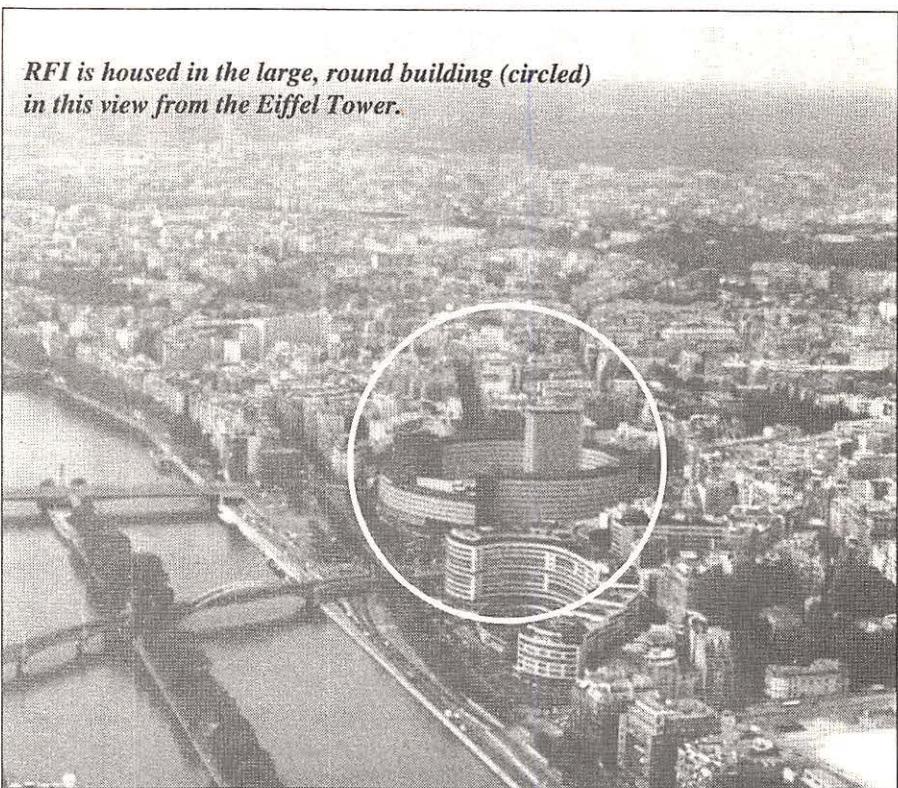


At a time when most broadcasters are looking very closely at their shortwave services trying to define what the role is for this service that some say is "passé," Radio France Internationale has embarked on a very elaborate and aggressive program to cover most of the world with their programs.

Since RFI only produces programs, and does not transmit them, it must work very closely with TDF (Télédiffusion de France) for their actual transmission. RFI no longer owns any transmitters in France or anywhere else, and contracts with TDF—what we call in North America a "common carrier"—to supply the necessary tools. TDF can supply shortwave (see sidebar story) or FM transmitters, satellite transponders, or other means, to best deliver the client's message.

But, as you will see, France has been no different from other governments in its fluctuating support for external broadcasting.

RFI is housed in the large, round building (circled) in this view from the Eiffel Tower.



Rocky Beginnings

May 6, 1931, was a most important day in the history of French shortwave broadcasting. The first "official" broadcast was transmitted from Paris from a studio built on the grounds of the Exposition Coloniale. No, you did not hear the national anthem as an identification signal, as you would today—the rooster crowing "Cocorico, cocorico!" was the ID signal for this new service.

Why did France decide to broadcast on shortwave at that particular time? Like all the colonial powers of the day, France had many colonies, overseas provinces, and other types of interests all around the world; many French nationals lived or worked in these far removed areas. For example, France had interests in Asia (Indochina), in many countries of Africa (Congo and others), in North America (Guadeloupe and St. Pierre et Miquelon), and in the South Pacific (Tahiti) etc. It became important for France to keep in touch with its nationals around the world, and reassure them

that "Métropole" had not forgotten them. Shortwave was also the perfect medium to bring to the local population the news, not only from France, but also from Europe and the world.

What was the content of these first broadcasts? Mostly economic news, artistic news, and current affairs; economic news to keep the French traders and planters abreast of what was going on in the world; artistic news, so that the expatriates would still feel part of the large family of France. There was even a small orchestra for live concerts.

The transmitter used then and for many years to come was located just outside Paris and had been built specifically for the "Poste Colonial de l'Etat Français"—two 15 kW transmitters with two antennae. These antennae were suspended from three 300 ft. towers—"state-of-the-art" in 1931.

The signals from this site were not only well heard in most of the French areas of Asia and Africa, but also in other countries of the world, according to the letters received in

Paris. This created some problems: critics of the shortwave transmissions said that the service was for the French population at large and money was being spent so that other countries could hear this new service . . . "This is not what this station was supposed to do with the taxpayers' money!" It would appear that nothing has really changed over the last fifty years: the same argument has recently been repeated—and not only by France!

The World Goes to War

Between 1932 and 1939 the station changed its name to Paris Mondial, increased its coverage, added many foreign languages programs, installed new transmitters, and became deeply involved in the ritual of pre-war propaganda. It is interesting that many countries started transmitting propaganda on shortwave during the period leading to World War II. The BBC started its transmissions during this period; Germany was using shortwave to sell their ideas; and—a little-known fact—Radio Moscow had the highest power and the largest number of hours on the air of any.

Toward the end of this prewar period, the French shortwave broadcasting program became a very hot political issue and each successive French government wanted to do something different with Paris-Mondial. Directors came and went, staff was hired and de-hired regularly, and the money set aside for new transmitters and equipment was continually being reallocated to other tasks. Despite this atmosphere of confusion, the station carried on its mandate.

In mid-May 1940, the invasion of France began; the staff from Paris-Mondial had to leave Paris and carry on broadcasting from various cities in France until mid-June. The staff working on foreign language programs was helped to escape from France. Those that had to remain in the country during the occupation kept a very low profile and lived with the underground groups.

Throughout the remainder of the war, some broadcasting took place from a station called Voix de la France. This propaganda station was operated under the watchful eyes of the German army and tried to cover the world with propaganda. The transmitters used were the same that

had been used before the war by Paris-Mondial. This equipment was destroyed in late August 1944, as the German army began its retreat.

Two stations in Africa attempted to maintain independent French broadcasts during the war years. One was located in the Congo—Radio Brazzaville—and the other in Algeria—Radio France. News to feed the Brazzaville station was intercepted on site by the radio operators and was used to prepare the news programs that were beamed not only to France, but also to other French colonies. It is said that the equipment used at the Brazzaville transmitter site had been manufactured in the USA and "somehow" found its way to Africa!

Radio France in Algiers was more a cultural station staffed by musicians, artists, reporters and university professors that had managed to escape from France in early 1940.

Post-War Reconstruction

The war ended in 1945 and it was time to rebuild RFI. Not only was it necessary to rebuild the technical side of the operation, but the service essentially had to be restarted from the ground up, including finding new staff. The postwar years have not been easy for RFI, nor were they easy for the various governments that "tried" to get France back on track in the first few years following D-day. As RFI was part of one or another government department during this period, its staff had to accept new directors and upper management as they were named by each new government. There is a story of one new director being intro-

duced to the staff during a formal meeting, who, because of the visibly hostile attitude of the staff present, decided to quit on the spot. This gesture won him the admiration of the surprised staff!

For many years the shortwave services from France were part of the larger government operated broadcasting complex, never really possessing autonomy. A clear mandate and some degree of independence were needed for the broadcast service before it could really operate well without always having to look over its shoulder to see what the government of the day was up to. It would appear that the shortwave services, in particular, were not considered essential and the budget would be "readjusted" on a regular basis as the money was needed for other tasks.

Finally, Radio France Internationale, as we know it today, was born in 1975, and given a proper name! Its goals were clarified and it gained a certain amount of autonomy. At the same time, TDF became the common carrier for RFI.

By the mid and late '80s, new areas of the world were opening as broadcast targets, and new techniques were becoming available to fill the gaps and increase the quality of RFI's worldwide coverage. Although RFI had lost its relay station in Brazzaville in the mid-50's, the modern equipment at the TDF's Issoudun/Allouis transmitter complex in central France had been able to provide coverage to most of the world.

A 500 kW radio station built in Moyabi, Gabon, in 1979 started renting time to RFI in 1981 to enhance RFI's coverage of the African continent and South America. Around the same period, TDF built a new transmitter site in Montsinéry, French Guyana. This new station helps RFI increase the efficiency of the coverage of certain areas in North America and Africa.

RFI/TDF also enters into reciprocal agreements with Japan to use the transmitter site in Yamata, Japan; and with China to use some transmitter time in Xian, Peking and Kunming. In Russia, RFI has access to the transmitter in Irkutsk. With these transmitting and relay sites RFI now has full and adequate coverage of the world via shortwave, except for Alaska and the southwest part of Australia. Figure 1 illustrates RFI's present shortwave coverage.

At the Allouis/Issoudun TDF transmitter sites in France, the following transmitting capabilities for shortwave are available to carry RFI programs:

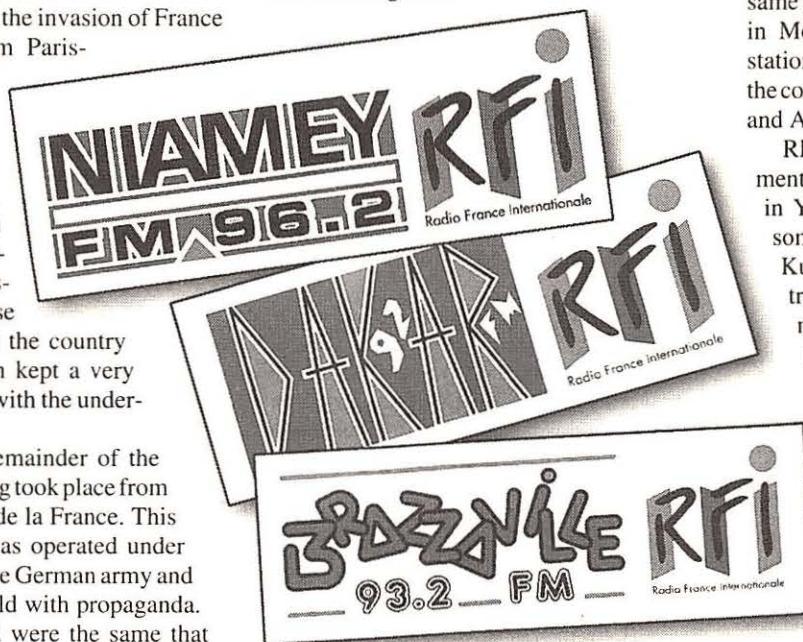


FIGURE 1

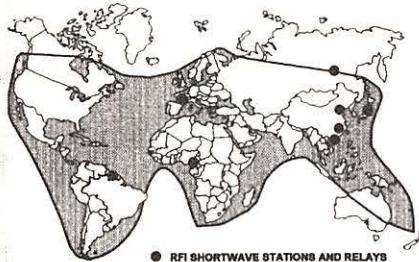


FIGURE 2



- 12 transmitters of 100 kW
- 54 curtain antennae
- 8 transmitters of 500 kW
- 35 curtain antennae
- 1 ALLISS 500 kW transmitter/rotating antenna module. This module is the first one installed in France and eventually many of the present transmitters and curtain antennae will be replaced by this new system. See the sidebar story.
- 1 additional ALLISS is installed but is on standby status only.

The French Guyana site is equipped with the following operational equipment:

- 4 transmitters of 500 kW
- 12 curtain antennae
- 1 TOUCAN module.

The TOUCAN in French Guyana is the same system as the new ALLISS installed in Allouis/Issoudun. But for technical reasons, in particular due to the high heat and extreme humidity of this site, the 500 kW transmitter is not located in the base of the rotating antenna, but is built in a separate transmitter building instead.

Looking Ahead

A new era is starting for RFI. Its main current objective is to promote the French language worldwide by every means possible. In addition, RFI is tasked with helping to train new broadcasting personnel, especially for the French-speaking African countries. Thirdly, RFI continues to broadcast in 16 other languages to sell France to the rest of the world.

To fulfill this role, RFI has to look to new techniques to ensure its presence everywhere around the globe. Since city dwellers do not normally listen to shortwave, RFI feeds its programs on the FM band. This is done in many cities in Africa (Dakar, Cotonou, Brazzaville, etc.), Europe (Paris, Berlin, Sofia, Moscow, Oslo etc.), and North America (New York, Ottawa, Washington).

One more tool is now added to the already large and elaborate transmission system: satellites are being used to cover the world. RFI can now be heard on one or more transponders of the following satellites: Intelsat 505, Intelsat 601, Eutelsat, Anik E2, Spacenet, Panamsat and Palapa. If you look at the various composite footprints of these satellites (Figure 2), you will see that very few areas of the world cannot receive RFI programs via satellite. RFI now has the world covered using one mode or the other. Radio France Internationale is no longer simply a shortwave broadcaster; it is now using all possible techniques to fulfill its mandate.

What is the future for RFI? I personally believe that RFI will not be much different in 10 years from what it is now. The only potential changes I can see will be those dictated by a changing world political environment. For now, RFI is fulfilling its assigned role in the world broadcasting community, and will remain a major player in the shortwave broadcasting field.

(See sidebar story, pp. 14-15)

TDF, Télédiffusion de France

TÉLÉDIFFUSION DE FRANCE is the "common carrier" that supplies the necessary tools for RFI to transmit its programs. But in what else is TDF involved in? In the field of broadcasting, TDF is the carrier for many, if not most, of the TV and radio programs in France and overseas. Certain areas of the world are still French territories or "departments." The radio and TV programming in these overseas areas are produced by RFO, Radio France Outre-mer, but the actual transmissions are done by TDF using facilities built and operated by them.

TDF not only offers transmission facilities to French companies, it also rents its facilities to foreign broadcasters that wish to use them for relay purposes. Japan and China are using this service daily.

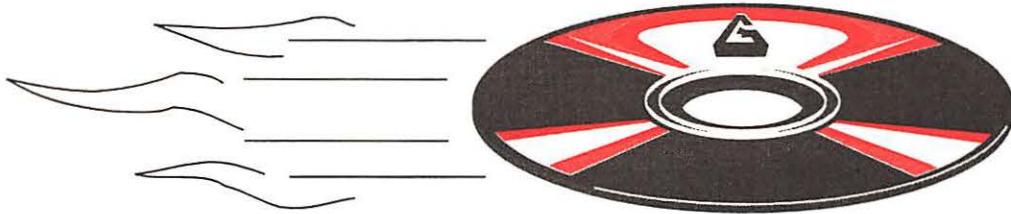
Cable TV, as it is known in North America, is not yet as prevalent in France as it is here. TDF is presently installing TV cable in many areas of France and carrying on research in this field.

Two other areas where TDF is involved are the RDS and synchronous FM transmissions. The synchro FM system is used on the super highways of France so that the driver does not have to change frequency along the way to receive necessary highway information. The system uses the same frequency, with many transmitters. By using the synchro FM system, no drop-off of the signal is experienced, and no heterodyne whistle is heard.

Radio Data System is another area where TDF is doing some research. This system is already in use in certain urban areas of Europe and North America to transmit digital traffic information to the car radio. TDF is studying the possibility of using a similar system on shortwave so that your receiver will know what station you are listening to. The RDS will also tell your radio which other frequencies are presently in use for this station, and even help your receiver decide which frequency to automatically tune to obtain the best signal.

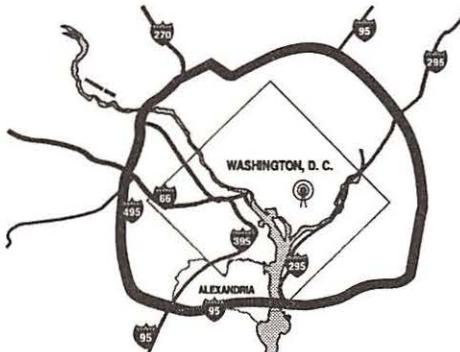
The new shortwave transmitters being installed by TDF could transmit this data. But we will be facing the following situation: will the receiver builders/designers have the necessary equipment on the market before the transmitters start transmitting the data, or will the broadcasters start sending the data before the receivers are available? Only time will tell!

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The ALLISS Antenna/Transmitter Module

By Jacques d'Avignon

Since the start of shortwave broadcasting in the early 1930's, it has been customary for a transmitting station to be made up of the following components: transmitter, large curtain-type antenna(e), feed lines, antennae switching matrix, and, if necessary, the antenna(e) baluns and dummy load. Each of these components was built as a separate unit and then assembled into a transmitting system.

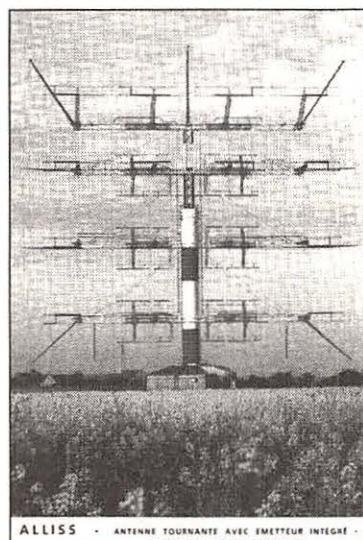
One of the major problems with this type of installation is that the antenna system is mechanically fixed; it has to be built favoring a specific direction. Any desired change in the required transmission azimuth is accomplished by inserting delay lines in the various parts of the curtain to slew the main horizontal transmission lobe. The maximum slewing angle possible with electrical slewing is about 30 degrees from the original boresight azimuth. If the broadcaster wants to drastically modify the azimuth of the main transmission lobe because a new target area becomes important, it is necessary to build a new antenna with all its associated circuits. This is not only extremely costly, but one must also possess or acquire adequate acreage for such a construction.

Over the last few years, Thomcast, together with TDF (Télédiffusion de France), has developed not only a new steerable antenna system, but a completely new concept of building a transmitter site. All the components described in the beginning paragraph are built into *one* module, and the rotating antenna can cover the full *360 degrees in 3 minutes or less*. In addition, both sides of this antenna curtain structure can be employed for two different frequency ranges. Almost the only limitation on the built-in flexibility of this system is that both sides of the antenna cannot transmit at the same time, nor can the antenna be rotated during transmissions.

This modular antenna and transmitter have been developed by Thomcast/TDF to replace some aging transmitters and curtain antennae at the Allouis/Issoudun sites of TDF. The name of the new antenna/transmitter module ALLISS is derived from Allouis/Issoudun sites where the first modules are being installed.

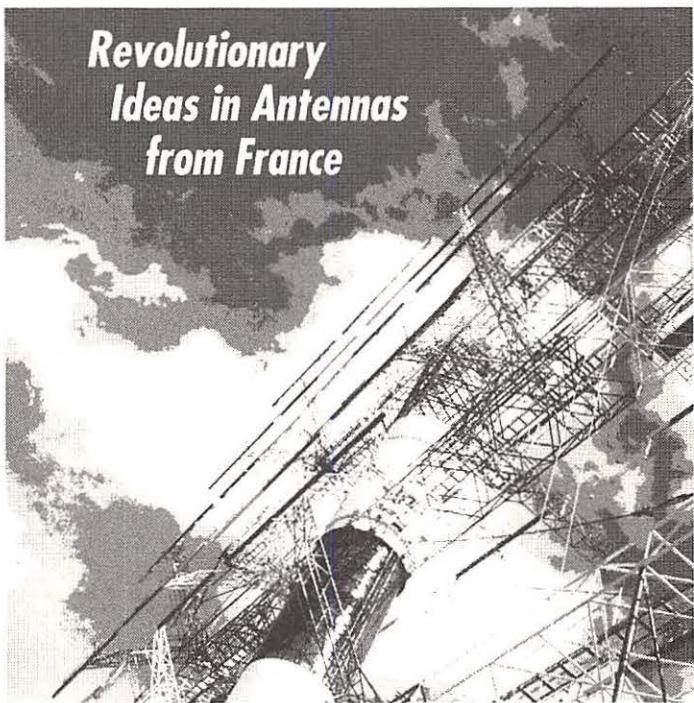
Taking A Closer Look

This rotating antenna can be built and tuned to cover two very specific frequency ranges: 4 to 15 MHz and 6 to 26 MHz. In the first model, one side of the rotating curtain antenna can transmit in the range 4-6 MHz and the other in the 9-15 MHz range. The second version of the antenna uses one side to transmit from 6 to 11 MHz and the reverse side to cover 11 to 26 MHz. Only one side of these rotating curtains can be used



A QSL from Télédiffusion de France confirming reception of the Radio France International signal.

Revolutionary Ideas in Antennas from France



at one time.

The transmitter building supports the complete antenna structure and houses the transmitter, the dummy load, the antenna balun and the antenna switching unit. The total mass of the building housing the transmitter and ancillary equipment is over 7,000 tons without the antenna; the antenna structure adds another 200 tons to the total mass of this module.

The antenna structure itself is a large curtain 275 feet wide and 275 feet high, and has been built to survive winds of 125 mph. Depending on the model of antenna—high or low HF—the curtain is composed of four dipoles in width and as many as six dipoles in height. These dipoles and the antenna matching unit, built inside the central antenna support, are specifically designed for a low SWR over a wide bandwidth. With this arrangement it is also easy to control the radiation angles: the horizontal angle can be slewed 30 to 60 degrees, and the vertical radiation angle can be varied between approximately 3 and 25 degrees.

The entire operation of the transmitter/antenna module can be completely controlled from a remote location, since each stage of the transmitter and antenna start up, switching, and loading operation are computer controlled.

Someone is sure to ask what is the forward gain of these antennae and what is the front to back ratio. Well, according to the document supplied by Thomcast, the front to back ratio is greater than 20 dB at any frequency for which the antenna is designed. The forward gain varies according to the frequency used and the configuration of the radiation pattern, but the gain ranges from 16 to 22 dBi—quite acceptable! If you feed this antenna with a 500 kW transmitter, you can imagine the Effective Radiated Power.

The dummy load for the 500 kW transmitter is a bath of salt water. Obviously, the recipe for this "soup" is calculated to present an

accurate and constant 50Ω impedance to the transmitter at all design frequencies. The coaxial conductor is a solid line of about 14 inches in diameter built in the centre post of the antenna curtain, in the same area where the balun transformer is located.

During the discussions on this antenna at the EDXC meeting in Paris, someone (who shall remain nameless!) asked the representatives from Thomcast if anyone had ever tried using this new antenna for receiving purposes. Apparently no one has done it yet, but I can see great possibilities for a super DX field day for shortwave listening or a ham operating weekend! I have already put my name down to be advised if any of these antennae are ever declared "surplus" and need a good home! I am looking for a very large piece of land with no power lines around—preferably in a salt water marsh—and someone who has the money to transport and build one of these modules. You can always dream...

Over the next few years (1995-1997), TDF will be revamping its complete Allouis/Issoudun sites, and when the remodelling is completed the transmitter and antenna lineup at each site will be as follows:

Allouis

- 11 ALLISS module covering 6-26 MHz
- 1 ALLISS module covering 4-6 MHz and 9-15 MHz

All transmitters in these modules are 500 kW

Issoudun

- 8 transmitters, 500 kW 36 curtain antennae

By the end of this year, Montsinéry in French Guyana will have the following setup:

- 4 transmitters, 500 kW with curtain antennae
- ITOUCAN antenna with a 500 kW transmitter. This setup is the same as an ALLISS module, but the transmitter is not built in the base of the antenna.

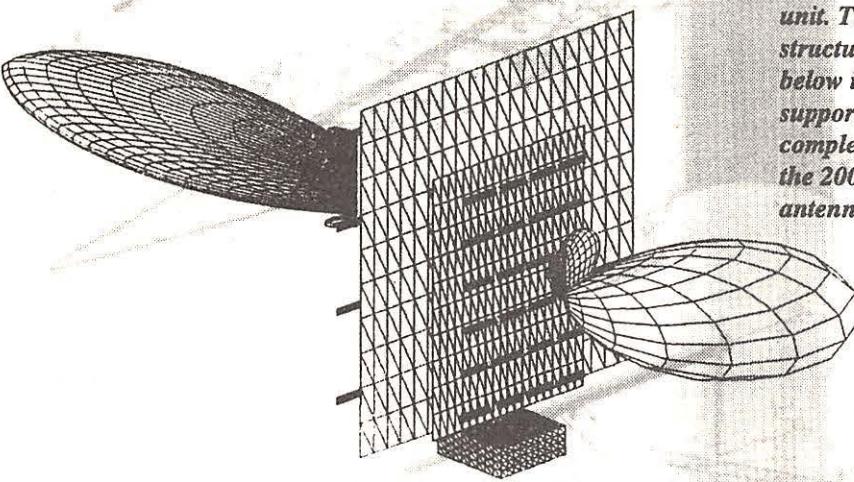
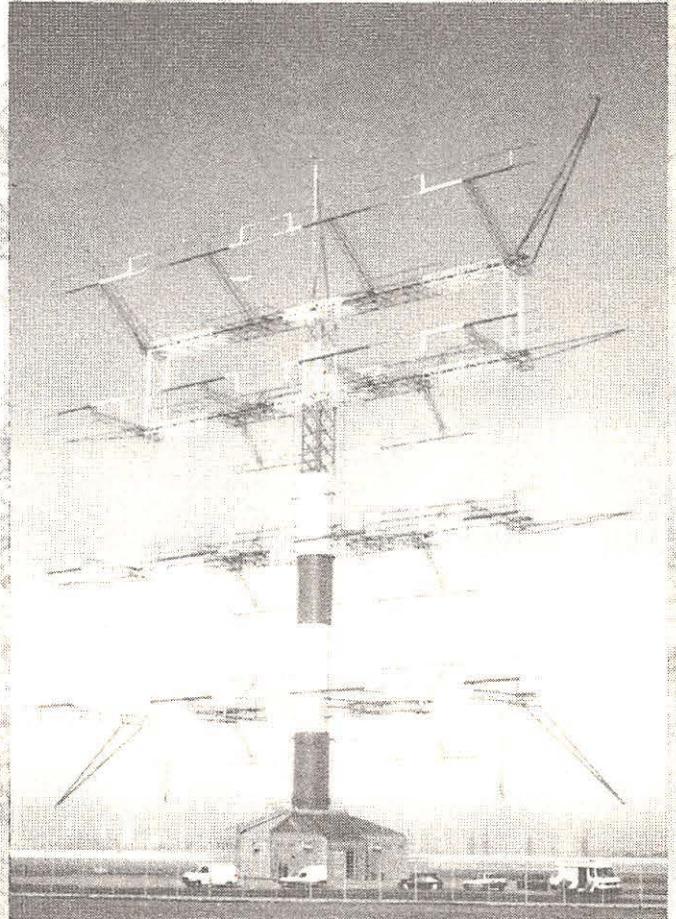
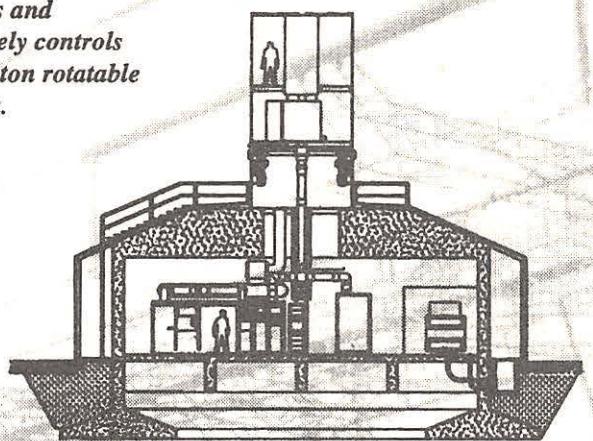
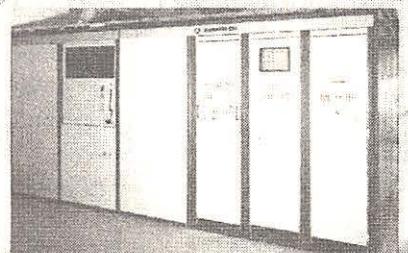


Diagram above simulates the radio wave dispersal pattern for the steerable ALLISS antenna.



The building at the base of the antenna houses the transmitter (right), the dummy load, the antenna balun and switching unit. The 7,000-ton structure (shown below in cross section) supports and completely controls the 200-ton rotatable antenna.





The Last Radio Frontier?

By Robert Williams

In our youth many of us were dedicated radio experimenters, trekking across the winter air-ways via crystal kits and super-regenerative sets, nightly explorers of the first magnitude with our mail-order 100-in-One's and our roof-top antenna farms. In those days to actually listen in by radio to someone across the street, across the country, or in a distant land (or far-away planet) was the essence of the dream.

In pursuit of this dream (and to the daily dismay of elders) we diligently amassed ever growing collections of discarded pop-bottles (a worthy enterprise at 2 cents apiece), towering volumes of irreplaceable sci-fi and popular-something-magazines, and coveted the occasional priceless military surplus radio chassis.

Few of us actually managed to conjure up our magic box—that homemade amplitude-modulated class 'C' three-tube 10 Watt radio transceiver; and what if we had actually managed to get our

unlicensed signal out there *ON THE AIR?* We always knew, deep in the pits of our stomachs, that the everpresent and allseeing Federal Communications Commission (the radio police) would surely descend upon us in full governmental force.

I recall that the idea of having to attend the 6th grade in black and white striped pajamas on Alcatraz or Devil's Island was enough to curb many a youthful endeavor.

Winter nights too numerous to count have since come and gone. Some fulfilled the dream through study and eventual Amateur Radio Licensing, some found delight in Citizens Band, many turned to Shortwave Listening as the purist's form, and of course, some of us just discovered new arenas for exploration. Hormones and automobiles may have accounted for our changing interests, but I believe that those once youthful radio experimenters may live on in many of us still.

1750 Meter Band

The Low Frequency (LF) radio band, generally referred to as longwave in the old days, extends from 30 to 300 kilohertz (kHz). LF has historically been the realm of maritime coastal ship-to-shore communications and localized marine radio positioning transmissions. The FCC confirms that, while the 1750 meters (160 to 190 kHz) has been largely deserted since the late 1950's, this portion of the LF frequency band is still open to unlicensed experimental and hobbyist transmissions, though at greatly restricted power levels and maximum measured antenna lengths.

Restrictions notwithstanding, these longwave frequencies are actively operated

and may offer us the last best opportunity in the 20th century for "oldtime" radio experimentation and exploration. 1750 meters may in fact be that youthful radio experimenter's last frontier.

LF Equipment

Hobbyist transmissions on 1750 meters are restricted to a maximum transmitter final amplifier power level of 1 Watt with a transmission antenna length of about 50 feet (15 meters), including the feedline. No restrictions exist on the mode of transmission used (CW, MCW, AM, DSB, SSB, FM, etc.). However, no restrictions exist on the use or the length of the antenna of 1750 meter band receivers. Therefore, successfully listening in on the 1750 meter band simply requires a

receiver capable of handling these low frequencies as well as the transmission modes most commonly used there.

There are equipment manufacturers that produce commercial and specialty line 1750 meter equipment. Few commercially available general coverage or shortwave receivers can tune down through the 1750 meter band or convert the signals commonly found there. Those that can, usually cost on the high side. So, unless we have that red Radio Flyer loaded with ancient popbottles buried in the backyard (both high-dollar collector items today) the money factor may be a subtle deterrent to our radio explorations rekindled. Thankfully, though, the most fulfilling rewards have always come from building and operating "homebrewed" equipment.

A 1750 Meter Band Direct Conversion Receiver

As an initial entry into 1750 meter LF operation, a homebrew receiver set that is easy on the parts count (the money factor) as well as being simple in construction and operation seems the answer. Towards this end I have always preferred solderless breadboard circuitry, using inexpensive or readily available components, simple single layer handwound ferrite toroid core inductors, and RF transformers (when necessary), plus the venerable old #216 9-Volt Battery for powering the circuitry. I believe you will find that the simple 1750 meter Direct Conversion Receiver described here fulfills these requirements nicely.

Almost any transmission mode can be used on 1750 meters, but the most common are CW (Continuous Wave Morse Code) and SSB or DSB (Single or Double Side Band Voice). So, any receiver destined for 160 to 190 kHz success should be, at a minimum, CW and Side Band capable—this one is.

The Circuit

Designed around the Direct Conversion receiver principle, this four-transistor circuit will allow the reception of Continuous Wave, Single and Double Side Band, as well as most other common transmission modulation methods—and all this while keeping the receiver's parts count and circuit complexity to a minimum. The receiver's electronic circuitry is shown schematically in Figure 1. A complete listing of receiver parts hardware is included.

The receiver contains a 1750 meter Variable Frequency Oscillator circuit (VFO), a Direct Conversion Detector circuit (DCD), and a direct coupled Audio Power Amplifier circuit with dual-diode Automatic Noise Limiter.

The VFO—a simplified common-collector series-resonate Colpitts oscillator—is tuned with a standard AM radio type 365 pF dual-stator tuning capacitor. The VFO provides a fairly stable RF signal while allowing continuous receiver coverage of the entire 1750 meter band.

The receiver's radio frequency input is applied directly to the DCD. This is a tuned narrow bandwidth input circuit requiring no radio frequency preamplification. The narrow bandwidth aspect of this receiver's input aids in limiting the effects of strong radio or noise signals occurring outside the 1750 meter band. This helps to keep the receiver from being overdriven.

Since receiver antenna lengths are unrestricted by the FCC, and because one-quarter

wavelength at 1750 meters is over 1300 feet (that's about one-quarter mile!), the antenna of choice for this receiver is the long, long, longer-the-better end-feed longwire type. The antenna is transformer-coupled in this circuit. Antenna transformer winding data is described along with the winding data for the VFO's 700 μ H inductor in Figure 1.

Selected 1750 meter signals present at the wire antenna are amplified and mixed, along with the VFO output signal, in the DCD circuit. The detector's usable output—the sum and difference frequency product conversion of the received RF and VFO—is the receiver's audio. The DCD outputs this directly-converted audio signal to the Audio Power Amplifier (APA). The APA includes the Automatic Noise Limiter circuitry.

The APA, a two transistor direct-coupled cascade audio power amplifier, will output noise-limited receiver audio to any inexpensive high impedance (10k Ohm or higher) monaural crystal earphone.

Receiver Construction and Testing

Preferring solderless breadboard circuit building as the quickest method to prototype a circuit and get it on the air, I have provided a component layout building diagram of the 1750 meter receiver's vertical-bus breadboard circuitry. This is shown in Figure 2. This receiver was designed to make vertical-bus breadboard construction as easy and painless as possible.

However, the vertical-bus component layout shown can be easily adapted to various common predrilled single-sided "Universal PC Boards" if you choose. In either case, just mimic the building diagram's receiver component layout while making sure that you observe proper circuit continuity. If built using the component parts at the values listed and shown schematically you should have no problems later with this simple receiver.

The only important testing requirement for the 1750 meter band receiver is to ensure VFO oscillation at the correct frequencies of opera-

FIGURE 1

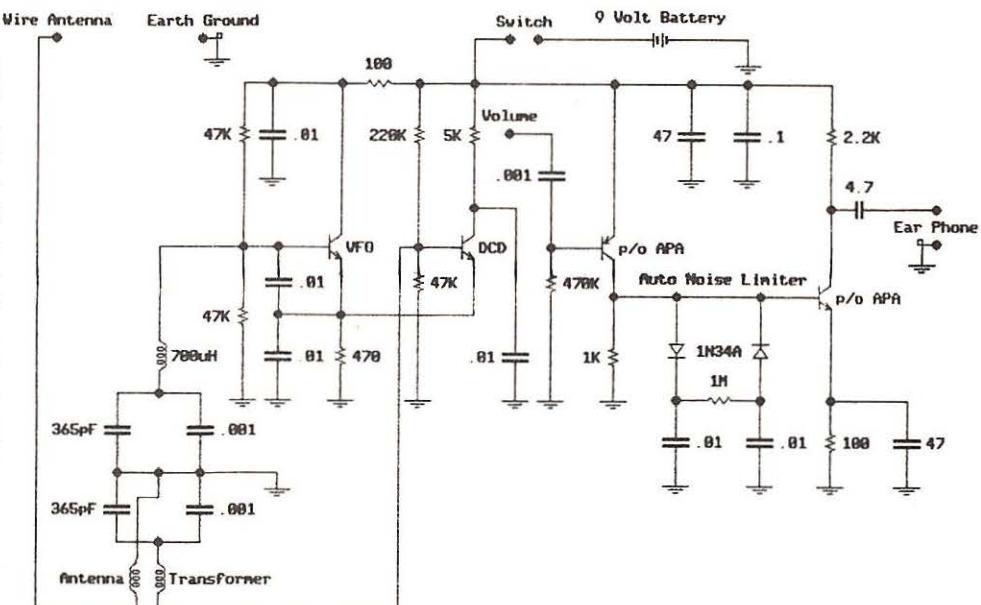
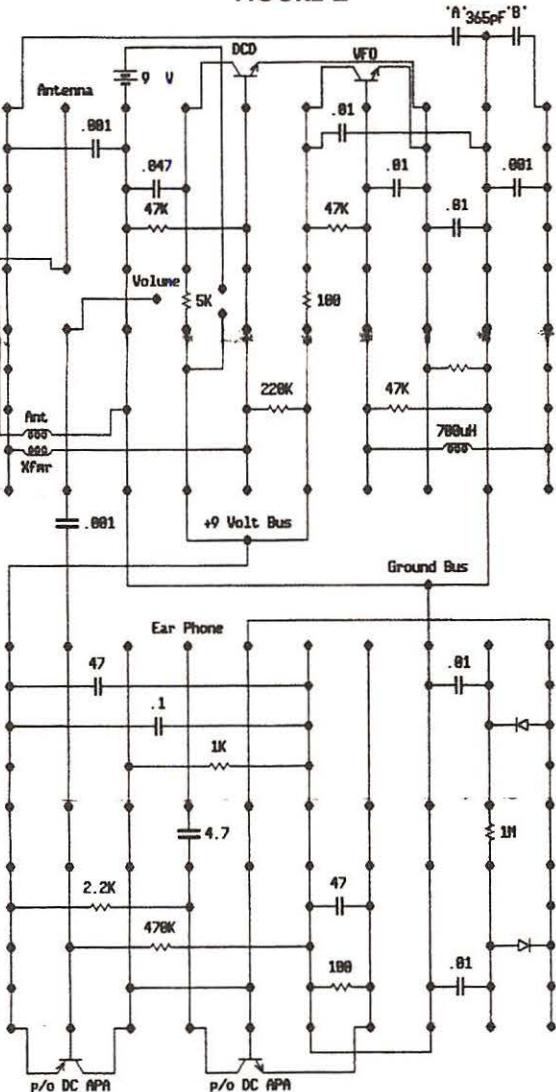


FIGURE 1.

PARTS LIST:

| QTY. | ITEM | QTY. | ITEM |
|------|----------------------------|------|---------------------------------|
| 1 | #216 9 Volt Battery | 3 | 47 Kohn 1/4 Watt Resistors |
| 1 | 9 Volt Battery Clip | 1 | 220 Kohn 1/4 Watt Resistor |
| 3 | MP8222A NPN Transistors | 1 | 470 Kohn 1/4 Watt Resistor |
| 1 | MP82907 PNP Transistor | 1 | 1 Mohn 1/4 Watt Resistor |
| 2 | 1N34A Diodes | 1 | 365 pF Split-Stator Tuning Cap. |
| 2 | T184-3 'Grey' Toroid Cores | 3 | .001 uF Disc Capacitors |
| 1 | 5Kohn Pot w/SPST Switch | 6 | .01 uF Disc Capacitors |
| 2 | 100 Ohm 1/4 Watt Resistors | 1 | .1 uF Disc Capacitor |
| 1 | 470 Ohm 1/4 Watt Resistor | 1 | 4.7 uF Non-polarized Cap. |
| 1 | 1 Kohn 1/4 Watt Resistor | 2 | 47 uF 16WV Electrolytic Cap. |
| 1 | 2.2 Kohn 1/4 Watt Resistor | 1 | Mini-Breadboard or equivalent |

FIGURE 2



Induction Winding Data: (1) 700 uH VFO Inductor—Core type T184 grey Mix #3 single-layer closewound 98 turns of No. 24 enameled wire; (2) 700 uH DCD Ant. Xfmr—Same core and winding data as with VFO inductor; (3) Secondary (Antenna side)—10 turns of No. 24 enameled wire, closewound and centered on the remaining 25% of the unused area of the T184 Antenna Transformer core.

tion. Although standard electronic circuit testing approaches using frequency counters and oscilloscopes can be used, basic testing of the receiver's VFO can be easily accomplished with the aid of any portable or table-top AM Radio having a Digital Tuning display.

First, wind the VFO's 700 μ H inductor and the DCD's Antenna Transformer as described in the inductor winding data. Then construct the receiver's VFO and DCD circuitry, but without including the DCD ferrite toroid core Antenna Transformer. When these sections are completed, test the VFO for proper operation by simply placing the AM Broadcast Band radio set near the VFO circuit's 700 μ H ferrite toroid core inductor.

With 9 Volt Battery power applied to the VFO circuit through the ON/OFF switch located on the rear of the 5k Ohm volume control potentiometer, tune the AM radio to about 760 kHz on the dial and listen to the audio output for a hissing sound. This should be easily identifiable when the 1750 meter receiver's 365 pF tuning capacitor is adjusted at or near minimum capacitance.

When the VFO's half of the dual 365 pF capacitor is at minimum capacitance—about 5 pF—the VFO should be oscillating at or just below 190 kHz. A harmonic of 190 kHz occurs at 760 kHz ($190 \times 4 = 760$). Note that you can also try this technique at 570 kHz on the AM dial (190×3) if 760 kHz AM is too noisy, or if a local station exists at that frequency. Either way, when you have accomplished this, mark the 190 kHz spot on the

What Can I Hear on 1750 Meters?

Following is a sampling of the many 1-Watt CW beacons operated by experimenters around the country. For more frequencies, follow the "Below 500 kHz" column in *Monitoring Times*, join the Longwave Club of America to get their bulletin *The Lowdown*(45 Wildflower Rd., Levittown, PA 19057), and purchase the *Longwave Beacon Guide* (\$15 from Ken Stryker, 2856-G West Touhy Ave., Chicago, IL 60645).

| Location/City | Callsign | Approx Freq |
|-------------------|----------|-------------|
| Northwest | | |
| Tacoma, WA | TAL | 187.3 kHz |
| Morro Bay, CA | C | 187.6 kHz |
| Southwest | | |
| San Jose, CA | MEL | 183.5 kHz |
| Hasset, TX | TEXAS | 184.5 kHz |
| Midwest | | |
| Lancaster, IL | BA | 186.4 kHz |
| Duluth, MN | RM | 189.8 kHz |
| Northeast | | |
| Centertown, NY | TFQ | 182.5 kHz |
| Boston, MA | BOS | 188.5 kHz |
| Southeast | | |
| Hilton Head, SC | ABC | 188.9 kHz |
| Warner Robins, GA | JDH | 184.5 kHz |

VFO tuning capacitor so you can readily identify the top of the 1750 meter band.

Determining across-band tuning increments for this simple 1750 meter receiver's VFO can be accomplished in a similar manner. Marking the tuning capacitor at 10 kHz increments, again by harmonically (VFO \times 4) identifying the VFO output frequency when at 180, 170, and 160 kHz, is perhaps the easiest. You could increment your VFO tuning to scale 5 kHz of 1 kHz steps, or in even smaller increments, if your AM broadcast band radio's digital frequency readout will allow.

Having confirmed proper VFO operation across the 1750 meter band, remove the 9 Volt power from the circuitry and complete the construction of the DCD by adding the Antenna Transformer. The remaining APA and Automatic Noise Limiter circuit sections should now also be constructed. Again, if the building diagram's receiver component layout is followed, while making sure to observe proper circuit continuity, you should have no problems making final on-the-air confirmation of proper receiver operation.

On The Air

With your end-fed long, long, long wire antenna (and a good Earth ground) connected to the 1750 meter receiver's antenna input points and 9 Volt power applied, you will immediately discover the number one drawback to all low frequency radio communications: NOISE, lots and lots of noise. High levels of both natural and manmade static is typical on 1750 meters. So much so that some have considered LF useless during daytime hours. The upper half of the band, 175 to 190 kHz, is most popular for daytime operation because noise levels tend to be lower, but the levels of manmade noise in your area will be the primary factor that determines your daytime 160 to 190 kHz success.

As you will discover, it is during the late evening hours (especially in winter months) when the 1750 meter band is at its very best. In fact, I predict you will find that LF long-range communication experimentation, conducted during the dead-of-night, can be very addictive.

Listening in on the 1750 meter band in your area may require the patience of Job and real perseverance (or maybe just a tendency to insomnia). On its best day (or night) long range on LF can't begin to rival the HF ham or shortwave bands, or even just a mail check on the old CB. But, 1750 meter operation can be an inexpensive source of hours of really great fun... just like in those days of young and dedicated experimenters, silently trekking across the winter airways via crystal kits and super-regen sets: nightly explorers of the first magnitude with mail-order 100-in-One's and roof-top antenna farms...

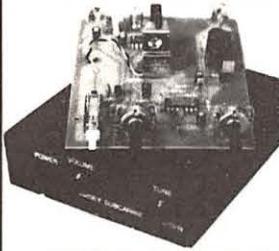
Good luck to you in the radio experimenter's Last Frontier.

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TONE GRABBER

to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

| | |
|--------------------------------------|----------|
| TG-1 Tone Grabber kit | \$99.95 |
| CTG Matching case set | \$14.95 |
| TG-1WT Fully assembled TG-1 and case | \$149.95 |



SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100KHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a

complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

| | |
|----------------------------|---------|
| SCA-1 Decoder kit | \$24.95 |
| CSCA Matching case set | \$14.95 |
| FR-1 FM receiver kit | \$19.95 |
| CRR Matching case for FR-1 | \$14.95 |

BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

PR-2 Broadband Preamp, Fully Wired and Tested \$59.95

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

| | |
|--------------------------------|---------|
| AR-1 Aircraft Receiver Kit | \$29.95 |
| C-AR Case and Knobset for AR-1 | \$14.95 |

FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to the antenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a build-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

| | |
|--|----------|
| DF-1 Foxhound direction finder kit | \$59.95 |
| CDF Matching case set for DF-1 | \$14.95 |
| FHT-1 SlyFox Foxhound transmitter kit | \$129.95 |
| FHD-1 Voice ID option | \$29.95 |
| CFHT Heavy duty metal case set for FHT-1 | \$29.95 |



FM RECEIVER/TRANSMITTER

Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tuned any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has 5W RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

| | |
|--|---------|
| FM Receiver kit | \$29.95 |
| Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz) | |
| CFR Matching case set | \$14.95 |
| FT-146 Two Meter FM trans kit | \$79.95 |

SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on/off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

| | |
|----------------------------------|---------|
| SCN-1 Scanner converter kit | \$49.95 |
| CSCN Matching case set | \$14.95 |
| SCN-1WT Assembled SCN-1 and case | \$89.95 |

STEREO TRANSMITTER

Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

| | |
|-------------------------------|---------|
| FM-10A Stereo transmitter kit | \$34.95 |
| CFM Case, whip ant set | \$14.95 |

INTERCEPTOR

The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is completely self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

| | |
|-----------------------------|----------|
| R10 Interceptor, | |
| Fully Wired 1 year warranty | \$349.95 |

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

| | |
|--|---------|
| SS-70 Scrambler/Descrambler kit | \$39.95 |
| CSSD Matching case set | \$14.95 |
| SS-70WT Fully assembled SS-70 and case set | \$79.95 |



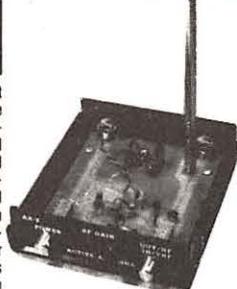
DSP FILTER

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. The remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

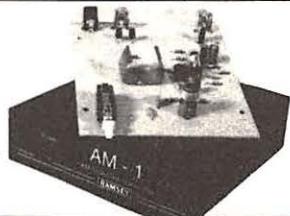
| | |
|---------------------|----------|
| W9GR DSP Filter | \$299.95 |
| 12V DC Power Supply | \$11.95 |

ACTIVE ANTENNA

Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack, RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!



| | |
|-----------------------------|---------|
| AA-7 Kit | \$24.95 |
| CAA Matching case & knobset | \$14.95 |



SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself and others-see how you can listen to the world on a receiver you built in an evening.

| | |
|--------------------------|---------|
| SR-1 Shortwave Radio Kit | \$29.95 |
| CSR Case and Knob Set | \$14.95 |

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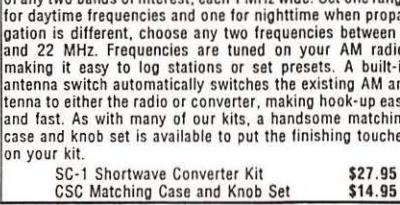
(No tech info at this number)

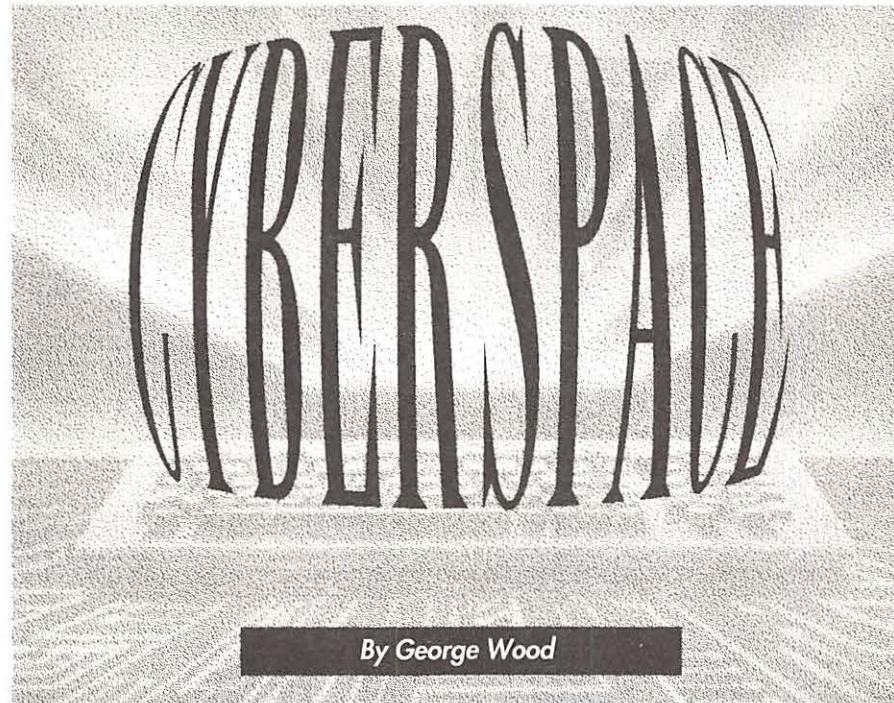
TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555

TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add \$4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add \$5.00. Orders under \$20 add \$3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts and labor warranty on wired units.

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793 CANNING PARKWAY, VICTOR NY 14564





The Information Super Highway is coming to a terminal near you. Soon you'll be able to access the world's radio and TV networks, as you DX Cyberspace on your PC. Or, to use the latest buzzwords, "Net surfing on the Infobahn."

"Information Superhighway," "Cyberspace," and "Infobahn" are concepts thrown around loosely nowadays for the emerging merger of computer, telephone, and broadcast cable networks. The domain of hackers and nerds (and radio freaks) is suddenly mainline. The Internet is on the cover of *Time* magazine, and Bill Clinton is only an E-mail away at president@whitehouse.gov

The business war is on to see who will rule cyberspace. Computer and media companies are buying each other up or building strategic alliances to see who'll be providing the programming of the future, who'll be bringing it into your home on fiber optic links, and who'll make the fancy decoder box that goes on top of the TV.

But radio is already in cyberspace, and the text-based systems of yesterday are being replaced with the sound and vision files of tomorrow. Today you can literally use your PC to tap into radio programming from the Voice of America, Canada, Ireland, and

"Internet Talk Radio," or the latest Reuters teletext business news, courtesy of CNN. Video isn't far behind, and more is on the way.

Back to the Beginning

Where is Cyberspace? One definition is that it's the place where a telephone call takes place...a very non-specific geography, a universe out there consisting of electrons moving along wires or photons slipping down threads of fiber optic cables. Never mind the futuristic models; cyberspace itself is as old as the telegraph.

Computers and radio hobbyists are by no means strangers. Applications grew from simple logging programs, to orbital calculators for amateur satellite enthusiasts. Then home computers were used for decoding RTTY, SSTV, and WEFA weather satellite photos, and for controlling the new generation of digital receivers and transceivers. However, computers crossed a major threshold with the introduction of the computer bulletin board.

SWLs soon set up their own boards, or had their own sections on larger boards. Online services followed suit, like CompuServe with its HamNet Forum. Then the FidoNet made

it possible to share mail between BBS's using cheap calling rates in the middle of the night. Suddenly your home BBS was plugged into one or more international conferences, like the SWL Echo, only a local phone call away.

It was at this point that broadcasters finally discovered computer communications; now listeners can send reports to stations, or perhaps download schedules and electronic bulletins like *Sweden Calling DXers*.

Enter the INTERNET

The Internet is the global network of computer networks that seems to be turning into the backbone of the much-vaunted "Information Super Highway" (sometimes known as the "Infobahn" by hackers and cyberfreaks). It began life as the Defense Department's Arpanet, linking defense contractors, government agencies, and academics. However, more and more universities bought PCs and terminals and wired them up into campus networks. Soon, just about any university instructor or student in the industrialized world was wired into the system.

Business has followed, seeing that the Internet is the easiest and cheapest way to maintain worldwide communications; and now the doors are being opened to private

individuals, without benefit of academic affiliation or a job at the right company. Today there are between 20 and 40 million Net users in 137 countries around the world. There's one new user every two minutes.

What's out there? A vast and confusing multitude of services. There's E-mail to everyone else connected, gigabytes of files about everything under the sun available for the downloading, multiple-user games, and hundreds of conferences (Newsgroups) running the gamut from astronomy and nuclear physics, to Hollywood gossip and advice for cat lovers.

For radio enthusiasts there are a number of interesting Newsgroups:

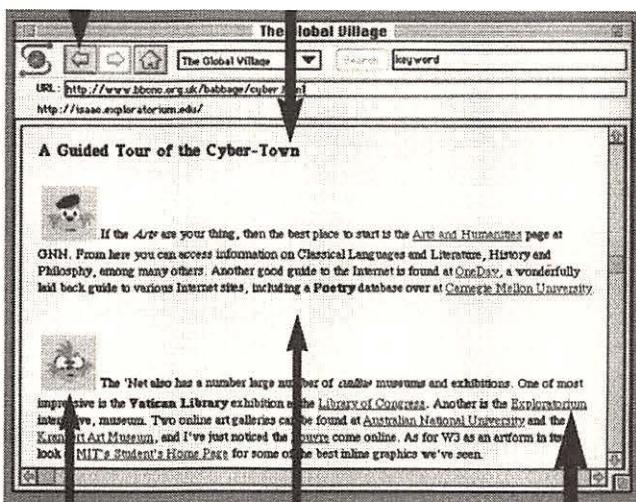
| | |
|------------------------|--------------------------|
| rec.radio.shortwave | rec.radio.scanner |
| rec.radio.info | rec.radio.amateur |
| rec.radio.broadcasting | equipment |
| rec.radio.noncomm | rec.radio.amateur.misc |
| rec.radio.pirate | rec.radio.amateur.policy |
| rec.radio.swap | alt.radio.networks.npr |
| rec.radio.cb | alt.radio.pirate |
| | alt.radio.scanner |

Here, hobbyists gather and exchange information, similar to the activity on the SWL Echo or the HamNet Forum on CompuServe, only magnified. What makes the Internet even more interesting is the growing presence of broadcasters.

Many stations have Internet mailboxes, sometimes directly on net servers, sometimes through gateways to other services, such as CompuServe, MCI Mail, or America Online. National Public Radio and the NBC *Nightly News* are on the Net. NBC uses the Internet to automatically send transcripts or summaries of special programs to interested viewers. One recent correspondent received the reply: "...If you want a summary of the five-part series *Almost 2001* that is running this week, please send an e-mail message to: summary@nbc.ge.com There are further e-mail addresses to receive transcripts of particular scripts or information about particular stories.

International broadcasters are on the Net as well. Thorsten Koch's excellent *The Internet Guide to Shortwave Broadcasters* lists E-mail addresses for 16 stations (see sidebar for a partial list). The Voice of America is starting to make extensive use of the Internet, with a number of addresses for different purposes. These include one for program schedule requests and general messages from inside the United States (letters-usa@voa.gov) and another for reception reports from inside the United States (qsl-usa.gov).

The VOA also makes news and schedules available through what is called a gopher

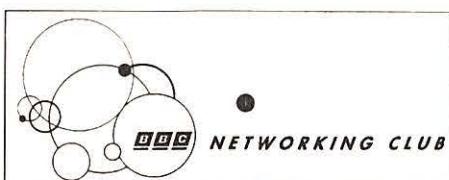


"The BBC Networking Club is connected to the World Wide Web, a new way of organizing the Internet to make it more accessible."

server. This allows users to browse for resources using a system of menus, bypassing the usual cumbersome Internet system. VOA material is available at [gopher.voa.gov](gopher://gopher.voa.gov)

Radio Japan is another international broadcaster on the Net. It has no E-mail address, but offers programming information at [gopher.ntt.jp](gopher://gopher.ntt.jp)

BBC



A major station which is about to establish itself on the information super highway in a big way is the British Broadcasting Corporation. Right now the *Write On* program on World Service announces cryptically "...Internet subscribers can find the BBC address on the shortwave users bulletin board."

But the entire BBC is getting involved in the Internet in a much bigger and more concrete way, by setting up something called the Networking Club. According to the Networking Club's Project Director Peter Ryding, it will allow members who join to have access to a computer bulletin board called "Auntie" (the BBC is often referred to affectionately in Britain as "Auntie Beeb"), as well as access to the Internet.

"The BBC is the first media organization to offer low-cost access to international computer networks," Ryding says. "The club offers the public and educational institutions access to BBC program schedules, background information about BBC programs,

factsheets, and importantly, on-line dialog with program-makers."

Internet users from outside the UK will be able to access information about the BBC, and will be admitted to Auntie itself if they pay the small monthly subscription fee.

Initially the service will be text-only, but sound and image files will be included later. The BBC Networking Club is connected to the World Wide Web, a new way of organizing the Internet to make it more accessible by greatly simplifying Net navigation.

Connection to the Web, using special interface software such as Mosaic, enables users to use a mouse to "point and click" as with the Macintosh or Windows, on specific words.

These special key words, through a system called hypertext, open into other sections, sometimes on the same location where the original text is found, sometimes on the other side of the world. Users can relatively effortlessly cruise the Net following the hypertext gateways.

The BBC's Web address is <http://www.bbenc.org.uk>. So far, the only other international broadcaster on the Web is Radio Japan, at <http://www.ntt.jp:80/japan/NHK>.

Tune into Internet Radio

But this is still only the beginning. The digital traffic traveling along the fiber optic, satellite, and telephone links of the Net originally was text-only. But as capacity expands and faster multi-media computers, equipped with sound and video boards, come into common use, sound and image files, including video, are appearing. These require far more resources than text files.

A typical *MediaScan/Sweden Calling DXers* online bulletin is somewhere between 10 and 20 kB (based on a radio program of at least 10 minutes in length). A GIF image file with a color photo that fills a computer screen can be between 150 and 200 kB. Compare that to a WAV sound file of a recent *MediaScan* program: at maximum compression, in mono, with 8 bit sampling and 11 kHz bandwidth, the file is more than 9 MB!

One major advantage of the Internet over your local BBS and even large online systems like CompuServe is that capacity is in place or



Art (the WebLouvre), music and radio are a keystroke away.

being built to accommodate the tremendous escalation as users add images and sound to their cyberspace exploration. The BBC is planning to add sound files in the future. But many radio sound sources already exist on the Net.

While Net surfing recently with Swedish Radio's network guru Kent Berggren, using the World Wide Web, we found a web server run by RTE radio in Ireland. There anyone with a sound card can download the latest newscast, and play it back—eight minutes of FM quality audio.

One of the biggest audio presences on the Net is the Canadian Broadcasting Corporation. An experimental database containing sound and text files from such CBC programs as *Quirks and Quarks*, *Basic Black*, and *Sun-*

day Morning has been established at the Communications Research Centre, Industry Canada's major research facility in Ottawa. The CBC says the trial represents the first ever presence on the Internet by a national broadcaster.

"The CBC trial provides a rich variety of general interest programming that gives listeners the ability to select program segments of their choice. These are available 'on demand' rather than being tied to a fixed broadcasting schedule."

"Future phases of the trial will build on existing content," says Michael McEwen, the CBC's Senior Voice-President of Radio Service, "with additional programming including SRC French language programming, foreign language programming from Radio Canada International, and eventually archival information. The trial will provide Internet users from around the globe with world-class Canadian content."

Much of this lies in the future. Currently the CBC section on the Internet contains a list of CBC Radio products, a list of transcripts available from the CBC, and sample radio programs in digital format. The CBC section is part of the World Wide Web, and is also available by Gopher and FTP (file transfers), at debra.dgbt.doc.ca

Another new Net sound source is the Voice of America. VOA programs in 15

languages, including English, are now available over the Internet. Every hour there's an updated VOA English newscast ready for the downloading.

The Internet Multicasting Service

Then there is Internet Talk Radio and the Internet Town Hall, two broadcast stations found *only* in Cyberspace. They're both part of the Internet Multicasting Service. Here are some excerpts from the service's description of itself in an online FAQ (Frequency Asked Questions) file:

"We're the first station in cyberspace, a source of news and information for the Internet community. We run two channels: Internet Talk Radio is a science and technology channel and the Internet Town Hall is devoted to public affairs.

"An hour of programming is 30 Megabytes. We'll typically publish anywhere from 30 minutes to 90 minutes of programming per day. We put the files onto UUNET which acts as a main distribution point for large regional networks around the world, such as IIJ in Japan, NASA, EUnet in Europe, and many others.

"If you are a UUNET customer, you simply use anonymous ftp to [ftp.uu.net](ftp://ftp.uu.net). If you belong to some other network, you'll look for the files on your local file server.

"The source files are in the Sun .au format, which is almost identical to the PC .wav format. If you use SOX, you can easily convert the files to a .wav file and play them using any of your standard sound utilities.

"Our flagship show on Internet Talk Radio is *Geek of the Week* featuring in-depth interviews with members of the technical community. We've talked to all sorts of famous engineers about topics such as the next generation of TCP/IP, resource discovery protocols, network security, and how to put toasters on the Internet.

"We also syndicate two radio shows from the public radio world. *TechNation: Americans and Technology* features great interviews by Dr. Moira Gunn, a former rocket scientist at NASA. *Soundprint* is an NPR show that features thoughtful looks at important topics.

What about the Internet Town Hall channel?

"We have our own broadcast booth in the National Press Club, joining C-SPAN and National Public Radio as the official licensees for the National Press Club Luncheon series. Speakers ranging from Miss Manners to Yassar Arafat to the Dalai Lama appear on this series."

E-mail addresses for international broadcasters:

World Radio Network (international broadcasters by satellite)
wrn@cityscape.co.uk

Radio For Peace International (Costa Rica)
rfpicr@nicarao.apc.org

Radio Havana
radiohc@tinored.cu

Radio HCJB (Ecuador)
English Department:
english@mhs.hcjeb.com.ec
program schedules are now available by
FTP to:
nw311.hcjeb.com.ec log-in as "anonymous" and use your
Internet address as your password.

Italian Radio Relay Service
CompuServe 100020,1013 (Internet
100020.1013@compuserve.com) Radio
Netherlands
MCI Mail 338-2983 (Internet
3382983@mciemail.com)

Radio New Zealand International
adrian@actrix.gen.nz

Radio Sweden
wood@stab.sr.se
CompuServe 70247,3516

BBC World Service
iac@bbc-ibar.demon.co.uk (Int'l
Audience Correspondence)
World Wide Web: <http://www.bbnc.org.uk>

Monitor Radio International (WCSN, WSHB,
KHB)

Letters and reception reports:
letterbox@csms.com
Technical questions: letterbox-tech@csms.com
Also, you can reach personnel of the
individual stations:
WCSN: Bob "Stes" Stessel, Station
Manager, stes@wcsn.csms.com
KHB: Doming Villar, Station Manager
doming@khbi.csms.com
WSHB: Ed Evans, Senior Station
Manager, cee@wshb.csms.com
Judy Cooke, QSL coordinator
judy@wshb.csms.com

Radio Free Europe / Radio Liberty
walcutt@rferl.org (David Walcutt)
Spectrum DX program at WWCR Nashville
spectrum@overleaf.com
askspctrum@attmail.com
spectrumshow@genie.geis.com

To get the entire FAQ file, you can send a blank E-mail message to: info@radio.com

Radio Sweden has also signed onto the digital radio superhighway. For several years text files based on the scripts of the *MediaScan/Sweden Calling DXers* program have been uploaded to Usenet newsgroup, CompuServe and similar online systems, and many telephone and packet radio-based BBS systems. But now, thanks to funet in Finland, there's an archive of *MediaScan* programs as SOUND.

The programs are available for file transfer (ftp) at [ftp.funet.fi](ftp://funet.fi) in the library/pub/sounds/RadioSweden/mediascan (note that the case of the letters is important). VOA programs are also stored in /pub/sounds (US law precludes distributing VOA programs to users within the United States, but anyone on the Net can access funet.fi).

The *MediaScan* programs are also being relayed as part of Internet Talk Radio, and are available from their site at <http://town.hall.org/radio/Sweden>

The next step is live radio on the Net. There's already been at least one experiment. In August the BBC *Radio Five Live* domestic service weekly program about computers, *The Big Byte*, was carried not only live on the radio and by satellite to Europe, but also live on the Internet! Users in Australia and Japan actually monitored the programs in realtime and sent back audio files of greetings that were played in the ongoing live broadcast.

The future promises more access to audio and video programming in realtime in the Internet. Groundwork is being laid by an ongoing experiment in developing multimedia applications on the Net called MBONE. Kauto Huopio, who uploads the *MediaScan* programs and electronic bulletins and similar material into funet, writes:

"The experimental 'multimedia network on top of Internet' is called MBONE, Multicast Backbone. MBONE has capabilities at present to send two videoconferencing-grade video streams and several audio channels through the Internet. It is an experiment, but there are regular broadcasts, for example, from Internet Multicasting Service and NASA. When they have the shuttle up, for instance, I can go to our university workstation class and see the shuttle video from NASA Select and hear the audio."

"MBONE needs at present UNIX workstations; PCs with MS-DOS/Windows are at present out of the question. There are even entertainment broadcasts; just a couple of days ago Telecom Finland sent a jazz concert from Pori Jazz to the Internet!"

The Information Super Highway is still

More Good Waypoints through Cyberspace

Thorsten Koch (thorsten.koch@informatik.uni-oldenburg.de) compiles a very useful *Internet Guide to Shortwave Broadcasters*. Thorsten writes: "Originally, this is a list I have compiled for the German DX club ADDX e.V." The Internet addresses of broadcasters, clubs, and specialists have been authorized by the owners of the addresses. Some gopher, ftp, and Usenet news info is also included. The list is available through:

- 1) regular updates through Usenet's <rec.radio.info> and <rec.radio.shortwave>, and
- 2) on ftp server [ftp.funet.fi](ftp://funet.fi): [/pub/dx/text/general.lists/Guide.ADDX](http://pub/dx/text/general.lists/Guide.ADDX)

MediaScan contributor Ralph Brandi comments: "Next time you go net.surfing, you might want to check the following World Wide Web link: <http://itre.uncecs.edu/radio/> This is a shortwave and satellite page put together by Pete Costello, pec@joker.att.com, and housed on a computer run by Jay Novello, jay@itre.uncecs.edu. It's still a work in progress, but it contains access to things like date and time servers for locations around the world, solar forecasts, sound clips of broadcasts, schedules and the like, broadcasters' official net sites, like CBC and VOA, and the <rec.radio.shortwave> FAQ (that's my part).

under construction, and one day today's Internet will seem like "the old route" you sometimes see running alongside the Interstate. Ultimately, people sitting in front of PCs may be able to tune into virtually any radio (or television) station in the world, and have it playing in the background (video in a small square on the screen), as they work on their regular applications.

The dividing line between PC and TV will grow very narrow, and the very concept of

"broadcasting" will have to be redefined or thrown out, when the bandwidth pouring into the screen can access thousands of video and audio sources from around the globe.

But that's still some time away. For the time being, the Internet is turning into a very interesting place to be for radio hobbyists, whether they want to communicate with each other, access their favorite stations, or become their own programmers.

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- NASA/AMSAT Satellite Tracking Elements
- Boardwatch/Connect/USA Today Doors
- Astronomy Databases
- Weather Information Door
- Internet FTP/Telnet in 1994

1 Year Membership - Full Downloading - No Ratios \$35.00

1 Year Membership - Full Downloading - Internet \$65.00

2 Year Membership - Full Downloading - Internet \$95.00

BBS: (214) 394-7438

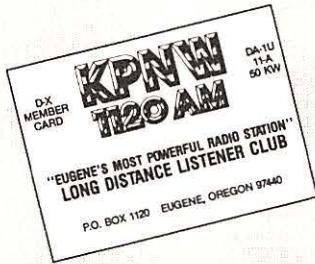
Voice: (214) 394-7325

Fax: (214) 492-7747

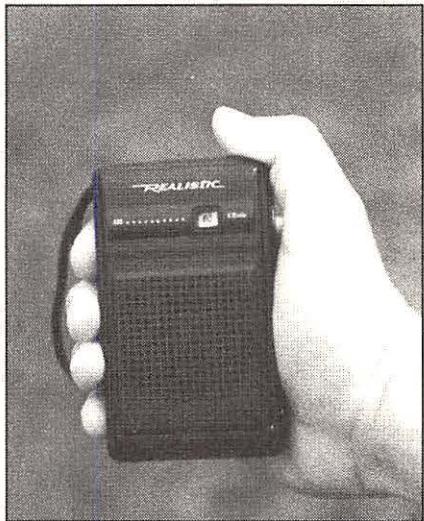
FLAVORADIO

As an emergency radio, Radio Shack's inexpensive AM model offers

compactness
and good
performance



By Brian Webb



At 4:32 a.m. on January 17, 1994, I was roused out of bed by the Northridge Earthquake. A few minutes later, a second quake struck. From the south I saw a bright flash, then the lights went out. As time passed, it became apparent that southern California had been hit hard.

I wanted to hear the news, but my \$900 communications receiver, which I had counted on as my source of news in an emergency, was dead. It came from the factory only capable of running on 110 VAC.

In the early morning gloom, I tried to hook up my backup communications receiver, which can run off 12 VDC, to my car battery. I had trouble finding the power cable and junction box. Then I had to string out an simple longwire antenna. The whole affair was so cumbersome that I gave up.

There I was, in the aftermath of a disaster, with no source of news. Meanwhile, one of my friends was casually listening to the news on a cheap, battery powered radio. The unit's portability, low cost, and above all, its self-contained power source, appealed to me. That morning I resolved to be better prepared for the next emergency by having at least one portable, battery powered radio.

The Minimum Specs

Before purchasing an emergency receiver, I gave some thought to the specifications that would be preferable in an

emergency radio. First, it would have to be able to receive the AM broadcast band, since most of the news is heard on mediumwave stations and they can often be heard over great distances at night.

Next, the radio would need sufficient sensitivity to pick up San Diego AM outlets from

my home in Thousand Oaks, 135 miles to the north. If a major earthquake should hit the region, Los Angeles stations could be knocked off the air and San Diego could be the only reliable source for news. The receiver would also have to be small so it could be easily carried around without getting in the way.

Fourth, and most important, it would have to be battery powered. And finally, I decided the radio should sell for under \$13.

At the local Radio Shack outlet I looked over the selection of portable receivers. The least expensive model—only \$6.99, in fact—was the Flavoradio, a product that's been on the market more than a decade. I figured that the tiny receiver would probably fit the bill, and at \$6.99 it was no great loss if it didn't. I settled for "blackberry"—the closest thing to black (there are three models of Flavoradio which are identical except for the color of the case).

A Surprising Performance

Once home, I decided to test my receiver before storing it with my other emergency supplies. Inserting two AA batteries, I turned the set on. The first order of business was to see how well it would bring in KFMB (760 kHz) from San Diego. The station was loud and clear. As a matter of fact, the midget pulled in San Diego much better than my old Zenith RE94Y table radio. The Flavoradio already appeared to meet my

TABLE 1

Distant stations logged in Thousand Oaks, CA, with the Flavoradio.

| Freq. (kHz) | Callsign | Power (kW) | Location/Comments |
|----------------|----------|---------------|--------------------------|
| 517 | ? | ? | NAVTEXT Transmission |
| 560 | KSFO | 5 | San Francisco, CA |
| 580 | KMJ | 5 | Fresno, CA |
| 600 | KOGO | 5 | San Diego, CA |
| 610 | KFRC | 5 | San Francisco, CA |
| 620 | KTAR | 5 | Phoenix, AZ |
| 660 | KTNN | 50 | Window Rock, AZ |
| 680 | KNBR | 50 | San Francisco, CA |
| 720 | KDWN | 50 | Las Vegas, NV |
| 740 | KCBS | 50 | San Francisco, CA |
| 760 | KFMB | 5 | San Diego, CA |
| 780 | KROW | 50 | Reno, NV |
| 810 | KGO | 50 | San Francisco, CA |
| 840 | KVEG | 25 | North Las Vegas, NV |
| 890 | KDXU | 10 | Saint George, UT |
| 1000 | KOMO | 50 | Seattle, WA |
| 1030 | KTWO | 50 | Casper, WY |
| 1120 | KPNW | 50 | Eugene, OR |
| 1140 | KHTK | 50 | Sacramento, CA |
| 1140 | KXNO | 2.5 | Las Vegas, NV |
| 1160 | KSL | 50 | Salt Lake City, UT |
| 1180 | KERI | 10 | Wasco, CA |
| 1350 | KSRO | 5 | Santa Rosa, CA |
| 1360 | KPOP | 5 | San Diego, CA |
| 1530 | KFBK | 50 | Sacramento, CA |
| 1560 | KNZR | 10 | Bakersfield, CA |
| 1731 | ? | ? | Repetitive Pulsed Signal |

"NEATLY ORGANIZED AND HIGHLY USEFUL"

Bob Grove, Publisher, Monitoring Times, Aug. 1994; Ref. North Carolina Edition

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immediate requirements.

It seemed reasonable that if it could pick up San Diego so well, the unit should also pull in distant AM DX. Slowly, I moved the tuning knob to 770 kHz, the frequency of KKOB in Albuquerque, NM. KKOB had an excellent signal, again better than what I was hearing on the old Zenith. With more tuning around, more familiar, distant stations were heard. The following evening's testing came across a strong signal with Native American singing. It was KTNN (660 kHz) from the Navajo Reservation in Window Rock, AZ. The signal was so strong that it sounded like a local station.

The Flavoradio's good performance intrigued me. I wondered how good this receiver really was and what kind of mediumwave DX could be heard on a basic radio with a little persistence. I decided to put the unit through its paces and to test my theory that successful DXing is more dependent on the DXer's persistence than it is on the quality of the equipment used.

The testing regimen was set up to evaluate the Flavoradio's performance under different conditions. During the day, I checked to see how well I could hear fringe stations—those AM outlets 100 miles or more distant. At night, I carefully searched the mediumwave band for DX stations. An R-5000 receiver was used to tune in the station being heard on the Radio Shack unit to determine the frequency. The 1994 *World Radio and TV Handbook* and 1984 edition of the *North American Radio-TV Station Guide* assisted in identifying the stations heard.

Over the 17 day period, some loggings were of special interest. On the first night, I tuned the radio to the bottom of the band to see if I could hear any of the local low power traveler's information service (TIS) transmitters on 530 kHz. No TIS stations were heard, but, to my surprise, a U.S. Coast Guard NAVTEXT radioteletype transmission came through on 517 kHz. The R-5000 had logged this transmission previously—probably from NMC near San Francisco. On the following night I tuned the Flavoradio beyond the top of the broadcast band, and found a repetitive, pulsed signal on 1731 kHz. The station, believed to be some type of navigation beacon, was weak but readable.

A station calling itself Casino Radio was heard on the third night. It was later identified as KXNO, a 2.5 kW broad-

caster from Las Vegas. The signal strength was good, which was surprising considering the station's modest power.

On the fourth night KTNN, the Navajo station from Arizona, came in again with a group of in-studio guests discussing Native American culture, and the Hoop Dance and Eagle Dance. The show ended with a song in English and Navajo by the group Red Thunder. Then the format switched to Country and Western music.

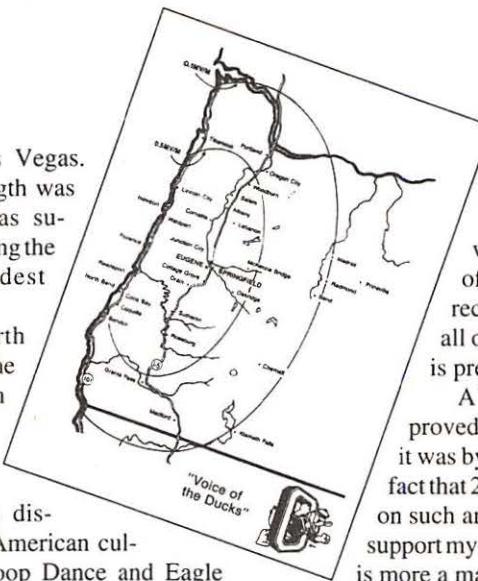
An hour later 50 kW KTWO from Casper, Wyoming, was heard. KTWO, at 925 miles, was the most distant station heard on the Flavoradio. Three nights later I logged KVEG, 840 kHz, from North Las Vegas. I was surprised to be able to hear KVEG at all because I live only a few miles from the towers for KCTQ which is parked on 850 kHz. On the same night I listened to the Wednesday Beatles program on KFRC from San Francisco. The Boss Radio format uses jingles and a program style from the late 60's and early 70's. I was transported to the days of AM radio from the years I was growing up in southern California. Besides having good programming, KFRC also had a decent signal for a 5 kW station 310 miles away.

The Flavoradio had enough sensitivity to receive a 5 kW station from 400 miles away, and a 50 kW station from as far away as 925 miles. In terms of selectivity, the unit also performed well. The internal ferrite antenna was fairly directional and allowed interfering stations and sources of radio noise to be reduced by rotating the radio.

Although the Flavoradio proved to be somewhat less sensitive than the R-5000, it sometimes provided the best reception of distant stations because the directional antenna allowed interference to be minimized.

The R-5000, with its 65 foot longwire antenna, received everything: the desired station, other stations on the same frequency, and the ambient electrical interference.

All told, a total of 27 distant stations were logged. Of these, eleven were from outside California. During the course of the evaluation, six states besides California were heard—



Not bad for a radio that costs less than \$7! Verification letters and QSL cards were received from several of the stations in exchange for reception reports. A listing of all of the distant stations logged is presented in Table 1.

Although the Flavoradio proved to be a fairly good receiver, it was by no means exceptional. The fact that 27 distant stations were heard on such an inexpensive radio tends to support my belief that successful DXing is more a matter of persistence than it is of having the best equipment.

Flavoradio — a real Lifesaver?

As a receiver, the Flavoradio has several points in its favor. To begin with, it's compact and can be easily retrieved and carried during an emergency. The unit is also self-contained with the power source and antenna carried internally. Power consumption is low and a pair of alkaline AA batteries can last for several days before needing replacement. The radio is ready to operate instantly and is easy to use.

Furthermore, it receives the AM broadcast band with sufficient sensitivity to pick up low power stations from long distances, even during the daytime. Selectivity is good and the directional antenna minimizes interference. These features, while important for DXing, may not be of much importance in an emergency. The Flavoradio has a durable plastic case and is rugged enough to withstand prolonged field use.

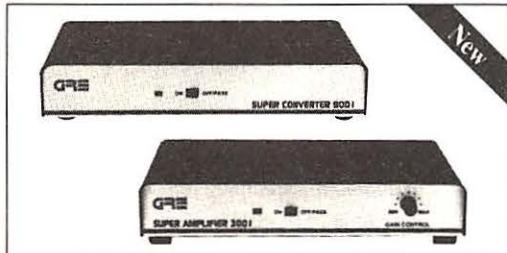
The radio does have its shortcomings, of course. The most obvious is that the earphone jack is on the back of the case, which makes using an earphone with the radio in your pocket awkward. Second, determining the frequency is difficult due to the small size of the tuning knob. This would be a moot point during an emergency because, instead of trying to tune to a specific frequency, you'd be searching for any station with news. Also, the tuning is somewhat tricky, but it's something that can be easily learned.

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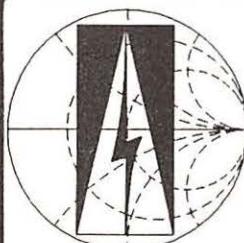


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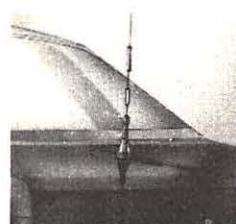
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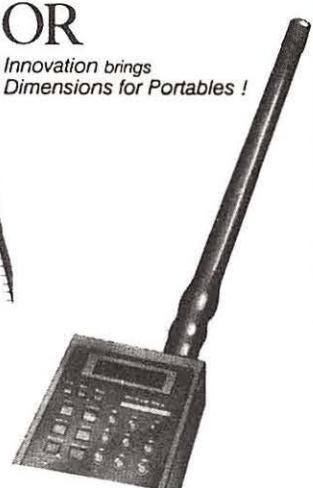
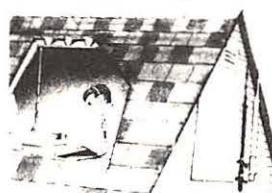
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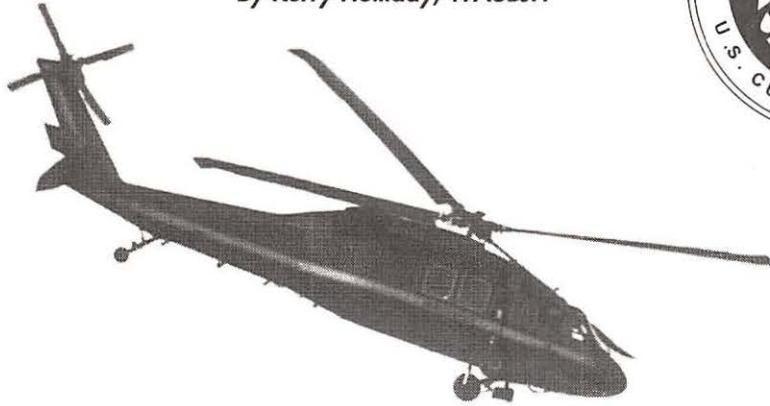
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Listening to U.S. Customs

Loud, Clear, and Local

By Kerry Holliday, WA6BJH



"All Customs units go to Alpha 2, all Customs units go to Alpha 2."

That was odd. I had been listening to what I thought was a police helicopter for ten minutes, now. The signal was on the local police mutual aid frequency, called CLEMARS, for California Law Enforcement Mutual Aid Radio System. But I should have realized that it was a Federal government helicopter. A state or local agency would have used phonetics "Adam," not "Alpha."

I didn't wait to figure it out. I went out to my ham shack to get my copy of *Government Radio Systems* (a primarily California-based directory by Robert Kelty). The only A2 US Customs Service frequency in the book was listed for Los Angeles, and I was in Woodland, 350 miles to the north. I tried it anyway. Sure enough, all the Customs agents, including the aircraft, went over to A2. The Customs Service was following a target car south on Interstate 505. They were 15 miles west of Woodland; the signals were strong.



"Target vehicle is continuing south on I-505, going under the overpass now, is out from under the overpass, and is continuing south."

My wife and I don't normally use external antennas on our scanners. The flex antennas on our 2 meter hand-holds work fine for local police and fire. And the aircraft was close, so we didn't need an external antenna. But as the aircraft and cars proceeded south along I-505, we realized that we would soon lose them.

"Can't we do any better with the reception?" Kathleen asked.

"Let me get the other antenna."

The "other antenna" was a home-made discone on 20 feet of TV mast. I kept it out at the ham shack and used it on packet radio. Now I moved the antenna to the front of the house and snaked the coax into the living room. The signals were much better on the discone.

We got out our road map of Yolo and Solano Counties and followed the aircraft's progress south along I-505.

"Target vehicle is approaching a small river," said the observer, "he's now across the river and continuing south."

"Putah Creek," I said.

"That must be a real parade out there on I-505," Kathleen said. "There's almost no traffic out there. Wouldn't he notice if all those people were following him? Especially a helicopter?"

"The aircraft said that the lead car is back a quarter of a mile. That's not too close. But I think that if I was smuggling something, I'd be looking in the air."

"Well," she said, "I hope they don't lose him in all the traffic when they get to Interstate 80."

"Maybe he'll stop at the Nut Tree Restaurant."

He didn't stop at the Nut Tree and the aircraft didn't lose him in the traffic on Interstate 80. We knew that at five in the afternoon the traffic would get much worse as they got closer to San Francisco.



Photo courtesy of Bill Mason, U.S. Customs Service

Green Valley Road, Texas Street, Vacaville, Fairfield. The aircraft called out the interchanges and the cities as the parade moved closer to San Francisco.

"It sounds like he's moving right along," Kathleen said.

"From the way it sounds, and from the interchanges they're passing, they must be doing seventy," I said.

"I hope the Highway Patrol doesn't pull them over."

"I'm sure they're coordinating."

"Wouldn't it be funny if they got into an aircraft speed trap and they all got pulled over by a herd of California Highway Patrol Mustangs?" Kathleen chortled.

The parade continued west. As they started down the hill into Vallejo, the aircraft sparked our interest again.

"All Customs units, he's pulling off into the rest area just outside Vallejo. He's pulling into the parking lot, now; he's parking in the back of the lot."

"That must be interesting. What do they all do, just pull in and park?" Kathleen said.

"The real problem," I said, "is that the restroom at that rest area has only two stalls, so if they all need to go at once, there's going to be a mad rush."

But that wasn't the real problem.

"I'm getting kind of low on fuel," we

heard the aircraft say. "I can be back on point in fifteen minutes." We couldn't hear any of the cars.

Where would he go? The road map showed only two possibilities: Napa County Airport and Travis Air Force Base. He didn't say where he was going.

"OK," said the aircraft. "Be back in fifteen minutes."

"How will they follow him without the helicopter?" Kathleen asked.

"The Customs agents must know how to tail people. I'm sure that's part of their training."

We heard nothing on the frequency for over fifteen minutes. We thought they might have switched channels or gone out of range. But then we heard the aircraft again.

"OK," said the aircraft. "We have an eyeball on him now. He's going between some oil tanks now."

"That's the Tosco Refinery," I said, "just past the Carquinez Strait Bridge."

How did the aircraft find the target car so easily in the traffic on Interstate 80? Good eyes? Maybe, but my bet is that they had a small transmitter hidden on the car. It would be easier to find the car that way.

Ten minutes later, the aircraft said, "We can't get below this cloud deck. You'll have to take it yourselves."

And with that, the chase seemed over. I went out to take care of some errands.

But the adventure was not quite over. When I got home, Kathleen said, "I heard them on the Bay Bridge and the last I heard he had gone south on U.S. 101 and then parked somewhere in Burlingame. I heard the Customs agents running license plates for all the cars near where the target car was parked."

And that was the end. We watched the news and read the papers, but there was nothing about a Customs bust. It may be in the news one day; I hope we recognize it when we see it.

Why was this operation in the clear? That's a good question. I know that the Customs Service has encryption equipment, because I when we first heard the aircraft, the observer said something about "transmitting in the clear." I assume that one of the decoders was broken. With that, everyone had to work in the clear.

We learned a few things from listening to the parade. We now have a beam antenna. The rotator is an "armstrong rotator," but that will change after the next hamfest. We learned that encryption systems, like all electronic equipment, are subject to Murphy's Law.

But most importantly, we learned that you never know what may drop in on your local police frequency.

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PS Form 3526, October 1994 (Reverse)

Aggressive New Motorola Stance ...

By Jorge Rodriguez

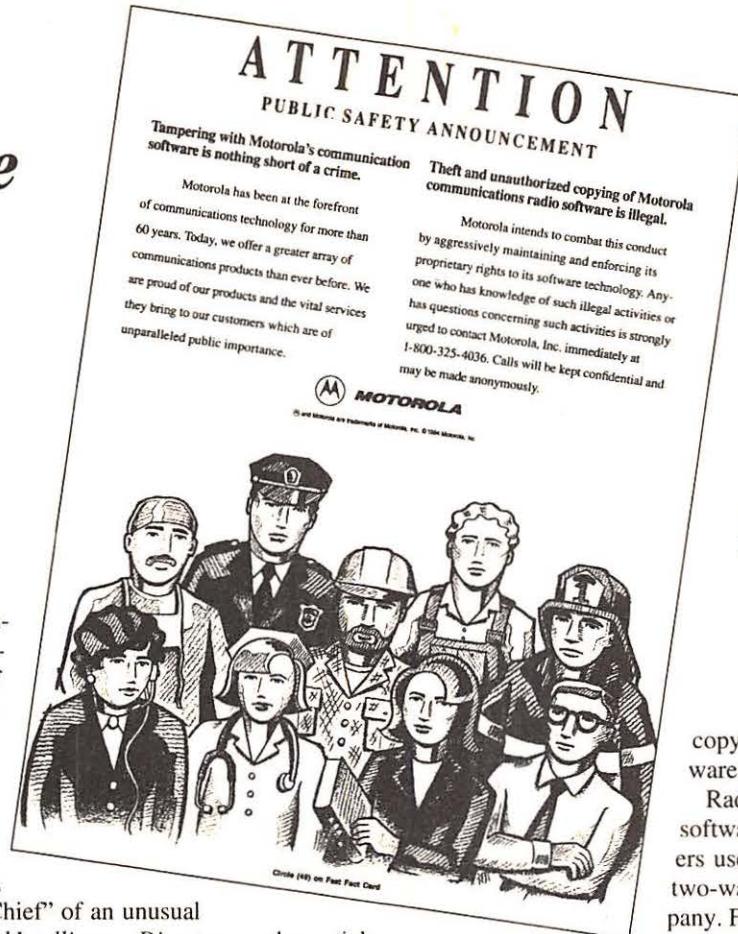
A scanner hobbyist and author of a book and articles on the hobby of radio monitoring was arrested in July for prowling. Francis James Harris, known to many in South Florida as Jay Harris, was arrested July 22nd inside a trash dumpster at the Motorola facility in Plantation, Florida. Harris is "Editor-in-Chief" of an unusual frequency book, *Frequency and Intelligence Directory*, and an article in *Monitoring Times*, "Gathering Communications Intelligence" (June 1994).

Harris' dumpster diving—the practice of looking through discarded trash for useful information or items—has been going on for a long time, by his own admission. Reliable sources close to Motorola claim when Harris first went in, Motorola placed large chains and padlocks on the dumpsters. Harris obtained keys for the padlocks and continued his intelligence gathering pastime. The company moved the dumpsters into a fenced area and posted No Trespassing signs. The fence did little to deter Harris, and finally in July Harris was arrested for trespassing. He was charged with prowling under a Ft. Lauderdale city ordinance.

In his possession, when he was arrested, was a hand held Motorola STX-821 800-MHz. two-way radio, which Harris tried to conceal. The radio was tuned to Ft. Lauderdale Police District I. "When Harris saw the officer's marked car he ducked into the dumpster in an attempt to hide... He threw the radio to the bottom of the dumpster to try and hide it," reported arresting officer Hendricks.

The radio was discovered programmed with nearly everything in the Sunshine State, including most South Florida police departments and private Motorola systems. It was confiscated and placed into evidence. Since then, it has been tested by Motorola and found to be fully capable of transmitting on the several systems for which it was programmed. Motorola "read" everything that was in the radio and was not pleased with what they found. They consider much of the programming to be proprietary.

On Aug 26th, Attorneys for Motorola, accompanied by U. S. Marshalls, searched Harris' home and business. The search was directed by a Court Order of Seizure by Judge William J. Zlochby and came out of a Federal civil case filed in August by Motorola (Motorola, Inc. v. Frequency Intelligence Administration; Francis J. Harris...). In the case, parts of which are sealed, Motorola claims Harris and his Frequency Intelligence Administration have infringed on Motorola



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Motorola frequently publishes warnings against tampering with proprietary software. Lately, Motorola has been showing the bite behind their bark.

Results in Arrest and Suit of Radio Hobbyist

copyrights for several Radio Service Software Programs and Motorola trademarks.

Radio Service Software (RSS) is the software Motorola and its authorized dealers use to program the new generation of two-way radios manufactured by the company. For years, Motorola has announced it would defend its right to its intellectual property and has even advertised warnings. The ads are featured frequently in professional two-way radio magazines. In the ads, Motorola warns that "tampering ..., theft and unauthorized copying of Motorola ... software is illegal." The company promises to "combat [unauthorized copying] by aggressively ... enforcing its proprietary rights to its software ..." The ads also carry a toll-free telephone number for informing Motorola of illegal activities concerning their software. "Whistle blowers" are promised anonymity.

At Harris' home, authorities and Motorola found computers with copies of "lab versions of Radio Service Software" (RSS) which Motorola does authorize for use or distribution to a non-Motorola entity. During the search, they also found a DES Key loader which is used to enter code keys for encrypted communications on Motorola radios and is rarely sold to the public sector. Several Motorola radios also were seized, as were disks, with handwritten markings recognized as RSS programs, including one labeled "STX LAB TOOLS." Agents also found "System Keys" to 43 systems; System Keys are proprietary Motorola software which allow an owner of a Motorola trunking radio system to alter the fleet and radio IDs.

Before the raid, agents for Motorola purchased a copy of Harris' *Frequency Intelligence Directory* which was described to the Court as containing "considerable information concerning radio frequencies, channel designators ... information concerning certain law enforcement, including U.S.A. Customs, US Marshall's Office, etc."

Harris has reportedly contacted the American Civil Liberties Union for help in defending himself against the charges brought by Motorola. He has been quoted in the press as saying that "The trade secrets are not as secret as Motorola claims they are," and that the data, codes, and equipment are widely available to the public. Motorola refused to comment on the matter and has yet to prove Harris has violated any law or infringed on any trademark or copyright. The case is still on-going, and it may be months in this climate of secrecy before it's all sorted out.

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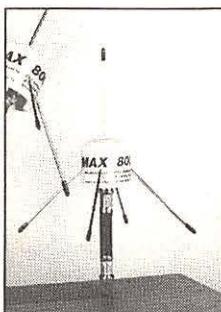
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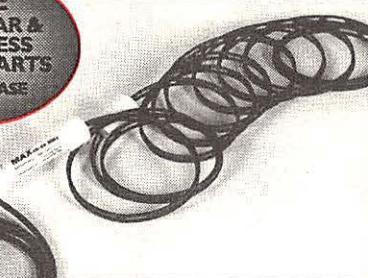
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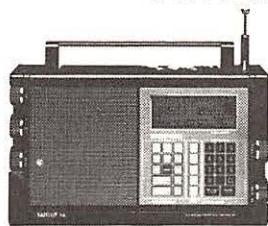
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Larry Van Horn, N5FPW

Occupation of Haiti

The long predicted invasion (oops—occupation) of Haiti is now a reality, and with it, some of the best HF military communications in recent memory has been reported by our Utility World readers. Utility enthusiasts from all over the country have enjoyed many days of “in-the-clear” communications on various HF frequencies from the naval forces off the coast of Haiti. Those readers that have a modem and who accessed the Grove BBS before, during, and after the operation, were tipped off almost as it happened.

Due to the large volume of mail, faxes, e-mail, and phone calls from a large number of listeners, this column cannot hope to print all the intercepts we have received relating to the Haiti operation. We will attempt to summarize the information that has been received to date.

I would like to thank the following monitors who provided such great insight, information, and, of course, frequencies: Steven Barrow, Tim Braun, Craig Clifton, Roger Cravens, Richard Dale, Todd Dokey, Larry Fowler, Edward Griffin, Bob Grove, Ross Lane, Phil Lewis, Brian Scott, and Bob Thomas. To each of you, thank you for the tremendous job you did in keeping up with a very fluid and fascinating communications event. Special thanks go out to John Bickel, Jeff Haverlah, and Bob Lewallyn for their exceptional dedication in monitoring during that long September weekend.

As Bob Grove noted in his *Closing Comments* in this issue, communications on some of these frequencies continue even as we prepare this column. By the time this reaches you, activity may still be heard on some or all of the frequencies noted below.

U.S. Navy Haiti Operations

The Frequencies

| | |
|--------|--|
| 2726 | Local Harbor Control (Haiti) |
| 4299 | Link 11 Data Channel |
| 5335 | Fleet Tactical (Fox Tango Net): Operational Discrete |
| 6363 | Fox Tango Network: voice coordination for Link 11 Air Coordination |
| 6735 | Fox Tango Network: JTF4 Caribbean voice coordination net |
| 8308.0 | Task Force: ship to ship enroute to Haiti |
| 8560.0 | Fleet Coordination [FC/FW Networks] |
| 8972.0 | US Navy Atlantic Safety of Flight |

The Call Signs

| Three Letter | Single Letter | PU Link 11 ID | Possible/Probable ID |
|--------------|---------------|---------------|--------------------------------------|
| N7X | Alpha | Victor Tango | Naval Vessel (FW) |
| --- | Bravo | ----- | Naval Vessel (LCU-63) |
| WOZ | Charlie | Papa Lima | Foxy (Foxtrot Charlie) |
| --- | Delta | ----- | Naval Vessel |
| H4T | Echo | Mike Mike | Naval Vessel |
| 9HW | Foxtrot | Xray Xray | Naval Vessel |
| --- | Golf | ----- | Naval Vessel (Foreign) |
| --- | Hotel | ----- | Unknown |
| OLK | India | November Papa | Guantanamo Bay, Cuba |
| --- | Kilo | ----- | Naval Vessel |
| --- | Lima | ----- | USS Mt. Whitney |
| --- | Mike | ----- | USS Monsoon (PC-4) with Seals aboard |

| | | | |
|-----|----------|----------------|---|
| --- | November | ----- | Unknown |
| M5Q | Oscar | Hotel Victor | Naval Vessel (FW) |
| 8BZ | Papa | Xray Charlie | Naval Vessel |
| --- | Romeo | ----- | Naval Vessel |
| --- | Sierra | ----- | Naval Vessel |
| FOL | Tango | Golf Papa | Naval Vessel |
| 7HU | Uniform | Juliett Yankee | Naval Vessel |
| 7SQ | Victor | Victor Mike | Naval Vessel |
| S9Y | Xray | ----- | Naval Vessel |
| --- | Yankee | ----- | Naval Vessel |
| OVY | Zulu | Foxtrot Mike | Naval Vessel (probably another PC vessel) |
| 6KO | ----- | Lima Foxtrot | Unknown |
| GOZ | ---- | Hotel Yankee | Ghost 02 (aircraft) |

| | | | | | |
|---------------------------|-------|--------------------|-----------------|-------|-----------------------------|
| Bravo Sierra | ----- | Naval Vessel | Charlie Uniform | .... | Coast Guard Cutter |
| (Task Force Command Ship) | | | Charlie Whiskey | .... | Coast Guard Cutter |
| Charlie Delta | ..... | Coast Guard Cutter | Charlie Zulu | ..... | Coast Guard Cutter |
| Charlie Echo | ..... | Coast Guard Cutter | Foxtrot Charlie | ..... | Coast Guard or Naval Vessel |
| Charlie Mike | ..... | Coast Guard Cutter | ----- | ..... | Vessel |
| Charlie November | . . | Coast Guard Cutter | Foxtrot Whiskey | .... | Air Controller aboard |
| Charlie Quebec | .... | Coast Guard Cutter | ----- | ..... | Naval Vessel |
| Charlie Papa | ..... | Coast Guard Cutter | Gold Finch 715 | .... | P3C Aircraft |
| Charlie Romeo | ..... | Coast Guard Cutter | November Lima | .... | Naval Vessel (Foreign) |
| Charlie Sierra | ..... | Coast Guard Cutter | Seahawk 01 | ..... | Naval Aircraft |

Whiskey Reports

These reports were used by ships not linked into the Alligator Playground (Link 11) in order to pass their positions to the rest of the Task Force. CR, CN, etc. passed their whiskey's to Foxtrot Charlie. The format was Latitude-Longitude-Corpin (Course [deg]/Speed [knots]).

This was by no means all the activity heard on HF frequencies during that weekend. Some monitors reported hearing the C-130 aircraft carrying the 82nd Airborne to Haiti using the call sign Cobra ##. These were the aircraft that—when the deal was finally struck in Port-Au-Prince—had to be called back, as they were already en route.

Several monitors also reported activity on Mystic Star channels from SAM 972 (the aircraft carrying Carter, Nunn, and Powell). Unfortunately, one listener heard a private conversation on Mystic Star between Carter, who was en route back to Washington, and the ambassador in Haiti. The monitor provided CNN with a complete transcript of the conversation. The next morning, the former President was hit with questions about that conversation by the CNN anchor Bernard Shaw, who said they got the transcript from a ham radio operator. A real dumb move, to say the least.

To each and every one of you who contributed information, especially the regular gang on the Grove BBS (message conference 10 - Utility World), Bravo Zulu to all for a job well done. The third weekend of September will probably be one of the most memorable in utility monitoring history for a long time to come.

Where Have All the Ruskies Gone?

Ute World Regular, Robert Hall of South Africa, drops in this month to ask the question, “Where have all the Ruskies gone?” Robert explains below.

“Since I began with RTTY some five years ago, there have been

many changes—in particular, a reduction in press transmissions. Where once one could find TASS on a dozen different frequencies at almost any time of the day, now we have to make do with the deadly dull stuff from KCNA-Pyongyang, MAP-Rabat, or the absolute pits—ATA-Tirana and XNA-Beijing! Granted, for those seeking intelligible news, there is still ANSA-Rome, and MENA-Cairo puts out a reasonable bulletin now and again. But the RTTY press listening seems not nearly so interesting today as it was three or four years ago. All the news agencies now use satellite communications. This in turn feeds newspapers, TV, and radio.

"Even when the band seems dead there has always been the alternative (*for Russian communications*) of tuning in to Russian merchant marine communications. With well over 6,000 ships operating within certain narrow frequency bands, and invariably at a standard 50/170 normal speed/shift, there has been no difficulty in logging different ships and callsigns throughout the day. Signals come in strongly from as far afield as Murmansk and Vladivostok, and in the Black and Caspian seas, mostly on and around 22360 kHz. But they are a lot more difficult to find nowadays!"

"The Russians have a signal book of free transmissions for sailors which follows somewhat formal and endearing themes... *I kiss your hands and feet Ekaterina Plisetskaya, etc.* Perhaps the Ekaterinas, Svetlanas, Nanushkas, and Olgas are going without their goodwill messages nowadays, or maybe Russian shipping has re-equipped with satellite communications. But this seems unlikely. I still hear the occasional signals, but they have more to do with catches of cod than the kissing of feet!"

"P.S.—I can now expose my above theorizing as complete bunkum, having just logged no less than 10 Russian ships sending hugs and kisses within thirty minutes, all between 16790 and 16803 kHz, and during their Sunday lunch between 1200-1230 UTC. So now we know where the Ruskies are!"

RAF Update

Sir Locksley (Robin Hood) in the UK has sent us an update to some Royal Air Force frequencies we recently published. Readers should note the following changes to your RAF Strike Command (STCICS) frequencies and designators:

| | | | |
|--------------|--------------|--------------|---------------|
| 2591.0 | Sierra Tango | 5713.0 | Bravo Echo |
| 5178.0 | Romeo Echo | 8965.0 | Charlie Hotel |

Russian Naval Station Changes Frequencies

Martin Potter in Ontario has been monitoring the Russian Navy station UMS at Petropavlovsk and Murmansk. He recently reported that up until August 1, 1994, he had been hearing the regular UMS broadcast on 7008.0, 14171.0, and 21284.0 kHz. Then, sometime around September 1, transmissions on 14171.0 kHz ceased and he found regular broadcasts on 10490.0 and 13449.0 kHz instead. Current frequencies for UMS are 7008.0, 10490.0, 13449.0 and 21284.0 kHz, so the Russians are no longer using only ham frequencies for these broadcasts. Martin notes that the present shift of these FSK signals is 200 Hz.

A typical UMS broadcast format includes a short burst of 25 Hz mark-space reversals (50 baud) immediately before each message, in addition to the periods of 18 Hz reversals sent during idle periods. He also notes that Morse code call sign RDL is still being used instead of UMS during the Morse messages, which are occasionally included in these broadcasts.

Russian Maritime Station Update

Some additional information has been received from Robin Hood on marine coastal station, Novorossiysk Radio, and its callsigns. UFN appears to be the main station for ocean-going vessels owned by Novorossiysk Shipping Company (NOVOSHIP). They operate CW/SSB/SITOR and 50 baud Cyrillic RTTY. The "collective callsign" to company ships is "4KN." The other station in Novorossiysk is UGW (recently changed from UNQ). They operate CW and RTTY mostly for fishing vessels owned by such outfits as Yugryba Novorossiysk. UGW's collective callsign is 4LA7.

Frequencies:

UFN

CW 4245.0, 8571.0, 8663.0, 12891.0, 13040.0, 17141.0,
22501.0, 22596.5 kHz
SSB 8761.0, 13101.0, 13191.0, 17242.0, 17389.0 kHz
SITOR 4211.0, 4213.5, 8423.0, 8432.5, 12597.5, 12602.0,
16839.5, 22386.0, 22397.5, 26114.5 kHz
50 baud RTTY uses the CW frequencies listed above.

UGW

CW 8704.5, 12660.5, 16980.0 kHz
50 baud RTTY on 12660.5 kHz

KFS Super-Station Network Expands

Ship radio officers on vessels in the Gulf of Mexico will notice an improvement in service from the Super-Station network of public coast stations. KFS World Communications has announced that WNU-Slidell Radio, Louisiana, has added an additional channel in the four megahertz marine band.

KFS World Communications, based in Half Moon Bay, California, is a maritime communications service provider that provides HF radio communications to the marine community. The company operates Palo Alto Radio (KFS) near San Francisco, California, and Slidell Radio (WNU) near New Orleans, Louisiana.

The Super-Station network utilizes remote control equipment and data lines between WNU and the KFS centralized facility in Half Moon Bay, California. This connection allows ships at sea to contact either station for messages.

Traffic lists sent by both stations are identical and include every message on hand, so that ships need listen to only one broadcast. Listeners should look for the selcals 1109 (WNU) and 1094 (KFS) when tuning in these SITOR broadcasts. All of the twelve ITU channels listed below are available when ships contact the network.

| ITU Ch # | Call Sign | Location | Shore Transmit | Ship Transmit |
|----------|-----------|------------|----------------|---------------|
| 401 | WNU | Louisiana | 4210.5 | 4172.5 |
| 403 | KFS | California | 4211.5 | 4173.5 |
| 603 | KFS | California | 6315.5 | 6264.0 |
| 627 | WNU | Louisiana | 6327.0 | 6281.0 |
| 803 | KFS | California | 8417.5 | 8399.5 |
| 819 | WNU | California | 12580.5 | 12478.0 |
| 1219 | WNU | Louisiana | 12588.5 | 12486.0 |
| 1257 | WNU | Louisiana | 12607.5 | 12505.0 |
| 1647 | KFS | California | 16829.5 | 16706.5 |
| 1657 | WNU | Louisiana | 16384.5 | 16711.5 |
| 2203 | KFS | California | 22377.5 | 22285.5 |

Now it's time to see what you have been hearing this month in the wide and wonderful world of the utility bands.

Utility Loggings

Larry Van Horn



Abbreviations used in this column

| | | | |
|----------|--|---------|--|
| AF2 | Air Force Two | FF | French Forces |
| AFB | Air Force Base | ID | Identification |
| ARQ | Synchronous transmission and automatic repetition teleprinter system | KCNA | Korean Central News Agency |
| ARQ-E | Single channel ARQ teleprinter system | LDOC | Long Distance Operational Control |
| ARQ-E3 | Single channel ARQ teleprinter system | LSB | Lower Sideband |
| ATC | Air Traffic Control | Meteo | Meteorology |
| CAMSLANT | Communications Area Master Station, Atlantic | MFA | Ministry of Foreign Affairs |
| CCG | Canadian Coast Guard | MWARA | Major World Air Route Area |
| CG | Coast Guard | NAT-C | North Atlantic MWARA area C |
| Comm | Communications | PAP | Polska Agencja Prasowa |
| CW | Continuous Wave (Morse Code) | PTT | Post, Telegraph and Telephone Administration |
| DE | From | RTTY | Radioteletype |
| DF | Direction Find | SAM | Special Air Mission |
| DGI | Cuban intelligence agency | Satcom | Satellite Communications |
| DSN | Defense Switching Network | SI-ARQ | Siemens simplex ARQ teleprinting system |
| EAM | Emergency Action Message | SITOR-A | Simplex teleprinting over radio system, mode A |
| Fax | Facsimile | SITOR-B | Simplex teleprinting over radio system, mode B |
| FEC | Forward Error Correction | Unid | Unidentified |
| FEC-A | One-way traffic FEC teleprinter system | US | United States |
| | | USB | Upper Sideband |
| | | USCG | US Coast Guard |
| | | USMAG | US Military Assistance Group |

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

| | | | |
|--------|---|--------|---|
| 2743.0 | Israeli Mossad number station with English 5-digit groups in AM at 0338 (Wed). (Bill Fernandez-MA) | 5300.5 | German 4-digit number station in USB at 0446. (Kevin Hecht-Devon, PA) |
| 2749.0 | VCS-CCG Halifax, NS, Canada, with weather broadcast in English and French in USB at 0542. (Fernandez-MA) | 5335.0 | US Navy FT network working Haiti ops in USB at various times. (Numerous reporters) |
| 2872.0 | Shanwick working many aircraft flights in USB at 0545. NAT-C MWARA. (Fernandez-MA) | 5530.0 | Unid station, identified as Nancy Adam Susan then 5 letter groups in USB at 2000. (Boender-Neth) |
| 3292.0 | Spanish female 4-digit number station in AM at 0411 (Fri). (Fernandez-MA) | 5547.0 | San Francisco ATC working New Zealand 51 at 0516 in USB. (Gordon Levine-Anaheim, CA) |
| 4028.0 | Spanish female 5-digit number station in AM at 0608 (Sun). (Fernandez-MA) | 5598.0 | New York ATC working Santa Maria ATC, passing flight information in USB at 0850. (Levine-CA) |
| 4524.5 | Juliet working Charlie Whiskey in USB at 1313. (Wendy Quinn-East Windsor, CT) <i>We have two young ladies with logs in this month's column. Nice to see you and Janet. Hope you check in often-Larry.</i> | 5628.0 | Honolulu ATC working Singapore 5, Philippine 103 in USB at 5628. (Levine-CA) |
| 4601.5 | Numerous 4 letter/number callsigns noted in CW and USB voice scrambling between 1952 and 2025. (Ary Boender-The Netherlands) | 5680.0 | USCG Rescue 1501 working CG Rescue 1714 (HC-130s) in USB at 1509. (Mike Comer-Titusville, FL) <i>Welcome back, Mike, hope to see you here often-Larry.</i> |
| 4665.0 | VLB14B05-Israeli Mossad number station with marker and no text afterward in AM at 0338 (Wed). (Fernandez-MA) | 5694.0 | Royal 167 calling Rainbow Radio (Tors Cove, NF) but no answer in USB at 0233. (Fernandez-MA) <i>Probably misdialed. Should be 5604.0-Larry.</i> |
| 4740.0 | English female number station repeating 684/32, no text followed in AM at 0341 (Wed). (Fernandez-MA) | 5696.0 | Delta 39 attempting to work CAMSLANT. Had just left Guantanamo Bay for local patrol in USB at 1058. Had just taken their radio guard. Xray 9 November working CAMSLANT, airborne from Gitmo for patrol in local area at 1102. (Henry Brown-MA) <i>Welcome back, Henry. Try our new internet address: grove@mercury.interpath.net-Larry.</i> |
| 4873.0 | KUL-unid station noted using 75 baud RTTY, "3/772 646464" plus 5 letter groups at 1857. (Boender-Neth) <i>We now believe these are Cuban DGI number stations. Anybody in Europe have any idea what country this station is in? We will have more on these DGI number stations in a future column-Larry.</i> | 6501.0 | NMN-CAMSLANT Chesapeake, VA, working SWUJ in USB regarding dead Cuban in a raft in USB. (Riddell-NY) <i>See 8763.0 log-Larry.</i> |
| 5182.0 | German female 3/2-digit number station in AM at 2242. (Fernandez-MA) | 6528.0 | Ragdoll calling Rimshoe and other callsigns, weak in USB at 1145. (Riddell-NY) |
| 5283.2 | Medicine Warrior 79, 23 working Warthog 60, Dustoff 60, Spearhead 18, and Medicine Warrior 95J. Medicine Warrior 79 notified other callsigns of movements of VIPs at an airfield. In LSB at 1324. (Harry Riddell-Rochester, NY) | 6731.0 | AF2 working Andrews AFB with phone patch traffic on F-432 in USB at 0405. (Jeff Jones-Tracy, CA) |
| 5297.0 | German female 3/2-digit number station in AM at 0424 (Fri). (Fernandez-MA) | 6738.0 | Suspicion on with EAM to 44XIAK aircraft. A minute later Suspicion using MacDill as ID. Then Ivory 42 (C-130 out of Dyess AFB/MacDill answers his Mainsail broadcast. Phone patch made to Raymond 10 (Tyndall AFB) in USB at 0039. (Fernandez-MA) |
| | | 6769.0 | Spanish female 5-digit number station in AM at 0100. (Tom Mazanec-Maple Heights, OH) |
| | | 6795.0 | Spanish female 5-digit number station in AM at 0300. (Mazanec-OH) |
| | | 6830.0 | Andrews working SAM 300 in USB at 1215. (Riddell-NY) |
| | | 6840.0 | Spanish female 4-digit number station in AM at 0300. (Mazanec-OH) |
| | | 6882.5 | Four or five QSOs on at the same time. Some stations females, all in Spanish and simplex in USB at 2308. (Fernandez-MA) |
| | | 6912.5 | VEV working Compactor with comm checks in USB at 1108. Also heard L7K working 3GA. (Riddell-NY) |
| | | 6952.0 | Spanish female 5-digit number station in AM at 0200. (Mazanec-OH) |
| | | 7379.0 | English female 5-digit number station at 0215-0230 in AM. (Rick Sumner-Olney, IL) <i>Thanks for checking in, Rick; love those number station logs, keep them coming-Larry.</i> |
| | | 7525.0 | Spanish female 5-digit number station in AM at 0000. (Sumner-IL) |
| | | 7580.0 | Spanish female 5-digit number station in AM at 0200. (Mazanec-OH) |
| | | 7609.0 | Cutter Gallatin working unid station regarding the number of immigrants picked up in USB at 0943 (Cuban refugee ops). (Brown-MA) |
| | | 7633.5 | Stealth advising Tradition they are slightly off frequency on Naval Gunfire Support frequency. Also heard Big Storm, Lightning 32, Heavy Metal 45 and Gunslinger 32. At various times from 2151 in USB. |
| | | 7635.0 | Two unid stations sending tactical traffic about helo support for an exercise and then on with regular comms in USB at 1544. (Fernandez-MA) |
| | | 7741.0 | Cutter Forward working 39 (Probably Delta 39) in USB at 1106. (Brown-MA) |
| | | 7861.0 | CW number station with 5-letter groups off at 0425. (Comer-FL) |
| | | 7936.0 | USN type voice scrambling in USB at 1403. (Comer-FL) |
| | | 8047.0 | Andrews calling 970 in USB at 0130 on F-752. (Phil Smith-Indianapolis, IN) |
| | | 8055.0 | Acrobat working Declination setting up duplex voice/data circuits on the following frequency combinations in LSB at 0550: 8055.0(*?)/6910.0 (Alpha 5?); 8055.0(*?)/? (Alpha 03); 8055.0 (*?)/9190.1 |

| | | | |
|---------|---|---------|--|
| 8010.0 | (Alpha 08). (* Indicates designator is probably an Alpha or Bravo designator). Acrobat mentioned, "you send out, we receive them send out to Albany." (Jones-CA) | 11178.0 | 11466.0 (F-965) at 1504. (E. Manon-Pasadena, MD) <i>Welcome, Mr. Manon; hope you check in often-Larry.</i> |
| 8080.0 | Big Storm, Ike and Flinch working each other in USB. See 8080.0. (Comer-FL) | 11214.0 | Ghost 1 calling PJK in USB at 2204. Is PJK Suffisant, Netherlands Antilles naval station? (Comer-FL) <i>Sure is-Larry.</i> |
| 8165.0 | At 1826 in USB, Lakewood calling Ike with local track count. Also had Big Storm in here. Also had Victorious in here needing someone on Ike in CIC to monitor this net. (Comer-FL) | 11216.7 | Computer/radar maintenance working Darkstar about equipment problems in USB at 2026. (Bruce Libey-Duluth, MN) |
| 8546.0 | KUL-Unid station with 75 baud RTTY "1/369" plus 5 letter groups at 0730. (Boender-Neth) <i>Cuban DGI station-Larry.</i> | 11220.0 | MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1906. (Hall-RSA) |
| 8560.0 | OBC3-Callao Radio, Peru, with hand sent V CW marker at 0852. (Jack Dix-Yonkers, NY) | 11226.0 | Andrews working SAM 974. Discussed malfunctioning secure communication equipment which Andrews attempted to fix via radio. In USB at 1313. (Whitney-VA) |
| 8600.0 | US Navy Fleet Coordination channel used for Haiti Operations in USB, 24 hours a day before and after the occupation. (Numerous Reporters) | 11229.0 | Nightwatch working Rest Camp on X-905 in USB at 2155. (Smith-IN) SAM working 206 in USB at 2116. (Riddell-NY) Nightwatch 01 working Andrews in USB at 1143. Moved to X-904. (Quinn-CT) |
| 8675.0 | UDB2-Unid marine coastal station with V CW marker at 1003. (Dix-NY) | 11246.7 | Andrews calling SAM 202 in USB at 0043 on F-823. (Smith-IN) Same at 2105. (Riddell-NY) |
| 8763.0 | Pilot station Port Canaveral, FL, working unid vessel with questions on off-loading that vessel's RHI with forklift to cradle. ETO officer advised. He will have OOD ready upon docking at Dolphin Lee Marina at 1423 in USB. (James Hugunin-IL) | 11410.0 | MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1903. (Hall-RSA) |
| 8967.0 | Saudi 005 working Jeddah LDOC, changed frequency to 6658 for phone patch in USB at 2208. (Boender-Neth) | 11423.6 | Missionary calling Jawbreaker for a radio check in LSB at 2345. (Jones-CA) |
| 9007.5 | Callsigns Mercedes, Chieftain, Furball, Furball-mobile, Icicle, Spanky, Cubby, and North Star coordinating troop/aircraft maneuvers. Mentioned UH-1 helo's and F-18s in USB at 0011. (Jones-CA) | 11488.0 | SOL242-PAP Warsaw, Poland with SITOR-B Polish news at 1859. (Hall-RSA) |
| 9027.0 | Andrews AFB working SAM 206 with signal checks in USB at 0011 in F-146. (Jones-CA) Same at 1319. (Riddell-NY) | 11545.0 | Andrews AFB working Trout 99 on secondary F-103. (Jones-CA) |
| 9032.0 | RAF Architect working Ascot 5595 with phone patch to Lyneham airbase in USB at 2215. (Robin Hood-UK) | 12130.0 | English female 5-digit number station in AM at 1844. (Hall-RSA) |
| 9041.5 | Mike working Q8, Coast 4, Golf, Ashley 08. Sounded like an FT net in USB at 2030. (Riddell-NY) <i>Probably was-Larry.</i> | 12216.0 | MFA Bonn, Germany, with ARQ-E idler at 1850. (Hall-RSA) |
| 9060.0 | RCU73-Novosibirsk Meteo, Russia, with 50 baud RTTY transmission at 0048. (Boender-Neth) | 12223.0 | MFA Warsaw, Poland with 75 baud RTTY news in English at 1440. (Boender-Neth) |
| 9130.0 | EZI-Israeli Mossad number station in AM at 2301, parallel to 11565.0. (Dix-NY) | 12697.0 | ZFO-Bulgarian embassy, Havana, Cuba, with 75 baud RTTY RY and message in Bulgarian to PNO at 1955. (Boender-Neth) |
| 9223.5 | Retail working Slapstick, asked to advise on Satcom in USB at 1727. (Comer-FL) | 12990.0 | UFZ-Unid marine coastal station with SITOR-A idler at 1108. (Dix-NY) |
| 9395.0 | HMFA 84-KCNA Pyongyang, North Korea, with 50 baud RTTY news in French at 2158. (Boender-Neth) | 13044.0 | UIS-Unid marine coastal station with V CW marker at 1402. (Dix-NY) |
| 10125.0 | CIO2-Israeli Mossad number station in AM at 0046/0245 (Daily). (Hecht-PA) | 13089.0 | VRX-Cape D'Aguilar Radio, Hong Kong, with CW CQ marker at 1050. (Dix-NY) |
| 10191.0 | MFA Rome, Italy, with ARQ-E 5 letter groups to several eastern European embassies at 1020. (Boender-Neth) | 13169.1 | NMN-CAMSLANT Chesapeake, VA, working unid vessel (callsign SWUJ) at 2100 about proper handling of dead male found adrift in boat now in tow. USCG will meet ship at mouth of Yucatan. (Hugunin-NJ) <i>Gayle's callsign book shows the Greek motor vessel Stella for callsign SWUJ-Larry.</i> |
| 10244.9 | RFTJF-FF Port Bouvet, Ivory Coast, with 839 HZ strange shift ARQ-E3 at 1654. (Robert Hall-RSA) | 13217.0 | 8BY-Unid station in CW sending "VVV DE 8BY" followed by 3 number groups ended at 2100. Who? (Roger-Cape Cod, MA) <i>Nothing real firm, but best information based on DFs is a commercial station in Indonesia-Larry.</i> |
| 10298.0 | Austrian embassy Tel Aviv, Israel, with SI-ARQ messages in German at 1158. (Boender-Neth) | 13438.0 | Andrews AFB working AF2 on F-251 with signal checks in USB at 1940. (Jones-CA) |
| 10364.4 | RFTJDA-FF Libreville, Gabon, idling with strange 823 Hz shift in ARQ-E3 at 1705. (Hall-RSA) | 13470.0 | DGN43-PIAB Bonn, Germany, (Bonames) with FEC-A German news at 2003. (Dix-NY) |
| 10365.0 | AHE Lyon working AHE Zenica with phone patches in USB at 0905. AHE Osijek working AHE Lyon in USB at 0925. (Boender-Neth) | 13950.0 | RKU71-Moscow Meteo, Russia, with fax weather chart at 1744. (Hall-RSA) |
| 10410.0 | KUL-Unid station with 75 baud RTTY, 1/396 plus 5 letter groups at 0715. (Boender-Neth) <i>Another frequency for KUL Cuban DGI somewhere in Europe-Larry.</i> | 14980.0 | ACB Unit 1 working unid station in LSB at 1310. USMAG. (Riddell-NY) |
| 10470.5 | FDC-Metz-Frascaty Air, France, with V CW marker at 2151. (Dix-NY) | 15728.0 | RAU-Unid station with 646464 then QRU using 75 baud RTTY at 1410. (Boender-Neth) <i>This also fits the Cuban DGI station format. First time I have seen this one; probably another European-Larry.</i> |
| 10780.0 | Cape Radio calling Trackstar in USB at 1446, switched them to net 8, found them on 3120. (Smith-IN) Noted 0439, switched them to 7412.0. (Comer-FL) <i>All this was up for classified DOD launch from Cape-Larry.</i> | 16196.0 | MFA-The Hague, Netherlands, with CW marker at 1520. (Boender-Neth) |
| 10858.0 | Spanish female 5-digit number station in AM at 1405. (Quinn-CT) | 16216.0 | RFFEDT-French Forces Buro Turquoise, France, with ARQ-E transmissions. RFFKDI-Kisangani Air, Rwanda with ARQ-E message for RFFEDT at 1315. (Boender-Neth) |
| 11046.8 | Swedish ARQ with plain language message about medical evacuations at 0722. (Hood-UK) | 16270.0 | Oostende Radio with USB phone patches to YJC, YPF, YSY, YKI at 1100. (Boender-Neth) |
| 11153.0 | Andrews working SAM 300 with phone patches to Pentagon regarding Cuban refugee problems in USB at 1800-2359. (Janet Whitney-Alexandria, VA) <i>Nice to have you aboard, Janet; please feel free to check in often-Larry.</i> | 16821.0 | OMZ-MFA Prague, Czech, with 75 baud RTTY messages at 2035. (Boender-Neth) |
| 11176.0 | Air Force Rescue 30 working Andrews in USB at 2219. Bold 87 working Ascension in USB. Phone patch to DSN 579 ---- 'Plantation'. Asked what frequency was Plantation on as F1 and F4, no contact. Passed two new designators of F8-23271.0 and F9-18027.0. (Welsh Dragon-Wales) SAM 204 working Andrews requested a discrete frequency, Andy passed F-965 at 1500 in USB. Moved to | 17170.0 | VRX-Cape D'Aguilar Radio, Hong Kong, with SITOR-B traffic list, new call? (Hall-RSA) <i>Looks like it, based on my notes and intercepts-Larry.</i> |
| | | 18134.8 | CIO2-Israeli Mossad number station in AM at 1348. (Dix-NY) |
| | | 18178.0 | MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1136, unlisted. (Hall-RSA) |
| | | 18290.0 | CIO2-Israeli Mossad number station in AM at 0048. (Hecht-PA) |
| | | 20348.5 | Andrews AFB working SAM 204 with signal checks on F-633. Checked this designator out of four locations in USB at 1942. (Jones-CA) |
| | | 20933.5 | 9RE203-PTT Lumumbashi, Zaire, with ARQ-M2 French traffic at 1150. (Hall-RSA) |
| | | | SOV293-PAP Warsaw, Poland, with 100 baud FEC message in Polish at 1425. (Boender-Neth) |

Bob Kay, c/o MT, P.O. Box 98, Brasstown, N.C. 28902

Scanning Gifts

In a few weeks, millions of Americans will crowd into shopping malls to observe a yearly tradition—Black Friday! Black Friday is the day after Thanksgiving, and the beginning of the holiday shopping season, when merchants hope to finally get their books into the black.

If you're a typical consumer, you'll spend hours looking for individual gifts at budget prices. Wouldn't it be helpful if you had a list of specific items for each person? I'm not talking about a shopping list that contains items costing several hundred dollars. As a scanning buff, a twenty-five foot roll of RG-6 coax cable for example, is more interesting (and probably less expensive), than a tie or shirt.

If you're nodding your head in agreement, here's my proposal: Prior to the start of the shopping season, hold a family meeting and exchange personalized shopping lists. Is there a carpenter in the family? If so, his/her "wish list" will probably contain dozens of items that can be found in local hardware and lumber supply stores.

As scanner buffs, our lists will contain items that can be located in Radio Shack stores and in mail order catalogs. To be effective, your list must identify the name of the item, where it can be found, and the price. Don't have time to make a list? No problem. Below is a budget-priced list, in ascending order by price, that contains a variety of scanning related items.

Gift List

I'll be the first to admit that circulating a personalized shopping list seems to be an audacious suggestion. However, the rules are changing. In today's fast-paced society, a personalized shopping list is acceptable and often requested. If you don't agree, simply use the list to shop for the scanning hobbyist in your life. See you in the Mall!

| Name | Location | Price | Name | Location | Price |
|---------------------------------------|--|-------------|--|--|----------|
| Crimp Connector Cat #278-223 | Radio Shack Nationwide | \$.99 cents | CD to Cassette Adapter Cat #12-1951 | Radio Shack Nationwide | \$19.99 |
| Coax sealant tape Cat #278-1645 | Radio Shack Nationwide | \$2.49 | Pocket Multimeter Cat #22-171 | Radio Shack Nationwide | \$24.99 |
| BNC Connector Cat #278-103 | Radio Shack Nationwide | \$2.99 | Scanner Multicoupler #CPL-SC | Grove Enterprises .. (704) 837-7081 | \$29.95 |
| Pliers, Long Nose Cat #64-1844 | Radio Shack Nationwide | \$3.49 | All Band Roof Antenna Cat #20-014 | Radio Shack Nationwide .. | \$29.99 |
| Cutters, Diagonal Cat # 64-1841 | Radio Shack Nationwide | \$4.49 | Calculator/Planner Cat #65-857 | Radio Shack Nationwide | \$29.99 |
| Soldering Pencil Cat #64-2055 | Radio Shack Nationwide | \$9.49 | Naval Amplified Speaker #SPK-11 | Grove Enterprises .. (704) 837-7081 | \$29.95 |
| Mini Speaker, Clip-on #SPK-9 | Grove Enterprises .. (704) 837-7081 | \$9.95 | Scantenna by Antenna- Craft #ANT-7 | Grove Enterprises .. (704) 837-7081 | \$39.95 |
| RG-6 Coax Cable 50', Cat #12-1951 | Radio Shack Nationwide | \$10.00 | Magnetic Mobile Antenna #ANT-4W | Grove Enterprises .. (704) 837-7081 | \$49.95 |
| Pro Crimping tool Cat #278-243 | Radio Shack Nationwide .. | \$15.99 | Scanner Beam #ANT-1 | Grove Enterprises .. (704) 837-7081 | \$59.95 |
| No-Tenna Invisible Antenna #ANT-20 | Grove Enterprises .. (704) 837-7081 | \$19.95 | Uniden Scanner Radio BC-855XLT #SCN-8 | Grove Enterprises .. (704) 837-7081 | \$169.95 |



Trying to stretch your holiday shopping budget? Check out this list of ideas that start at 99 cents.

Treasure Hunt

One of the most popular monitoring targets is the 800 to 1200 megahertz band. Other popular names include: microwave mobile band and 800 megahertz band. Regardless of what you prefer to call it, there seems to be one common question: What's up there to hear?"

We all know that cellular phones are between 870 and 896 MHz. But, in addition to the cellular frequencies, there are dozens of additional agencies that are operating radio equipment between 800 and 1200 megahertz.

For the November/December Treasure Hunt, I'm offering an 8.5x11" frequency allocation chart that will take the guess work out of monitoring this popular band. Can't find the "Private Microwave Service?" A quick glance at the chart will tell you that the frequency range is between 952.10 and 952.70 MHz.

Here are the clues:

- 1) Name the company that is offering a CD-ROM frequency database with mapping.
- 2) I ordered a CHT-1 from Grove. What did I get?
- 3) I ordered Cat #22-104 from Radio Shack. What did I get?
- 4) The Radio Shack Pro-43 has an "instant weather" feature. True or False?
- 5) The frequency of 156.80 belongs to what agency?

Everyone who enters the November/December Treasure Hunt will receive the frequency allocation chart. However, you must include a #10, SASE. Entries that do not include an SASE will not be honored. Send your entries to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902.

Frequency Exchange

Our first stop this month may be a little confusing. We're going to **Suffolk County, New York**, via Miramar, Florida. Why? Harvey Bernstein lives in Miramar, but he routinely travels to Suffolk County. So, we're going to Florida to pick up the frequencies for New York.

Suffolk County Fire

| | |
|---------|---|
| 45.20 | Amityville Village |
| 45.88 | Mutual Aid |
| 46.30 | Fireground & training 5 watts maximum |
| 46.34 | Fire scene |
| 46.36 | Districts 1 & 5 |
| 46.38 | Fireground (countywide) |
| 46.44 | Districts 3 & 4 |
| 46.46 | Dispatch |
| 46.48 | Districts 6 & 7 |
| 153.83 | Fireground & training 10 watts maximum |
| 154.145 | Coram fire Dept. |
| 460.55 | North Patchogue Fire Dept. |

Queens

| | |
|------------------------------|-----------------------|
| (Volunteer Fire Departments) | |
| 47.50 | Rock Away Point |
| 154.40 | Point Breezy |
| 154.57 | Point Bree |
| 154.60 | Roxbury |

Nassau County

| | |
|---------|---|
| 42.96 | Fire Academy |
| 46.10 | County Wide Dis- patch |
| 46.12 | Divisions 5, 8 & 9 |
| 46.20 | Divisions 2, 3 & 4 |
| 46.22 | Unit to unit |
| 46.30 | Unit to unit & fireground |
| 46.32 | Divisions 1, 6 & 7 |
| 154.04 | Garden City fire units |
| 154.115 | Dispatch—Atlantic Beach rescue |
| 453.325 | Fire marshal/Haz Mat units |

Miscellaneous Fire

| | |
|----------|--|
| 154.19 | Staten Island |
| 453.10 | Syasset |
| 458.6125 | New Hyde Park |
| 477.1625 | ... Glenwood Landing |
| 465.5875 | ... Long Beach Fire (mobile repeater) |
| 465.60 | East Meadow |

Harvey's complete three page list contains fire frequencies for the Long Island Expressway, Nassau County, Bronx, Brooklyn, Queens and Staten Island. If you want the list, it's free for a #10 SASE. Send your request to the Frequency Exchange, P.O. Box 98 Brasstown, NC 28902.

Since we're already in the warm state of Florida, let's check out an anonymous invitation that lists the **Nationwide Fast Food** frequencies.

| Arby's | McDonalds | Hardee's | Kentucky Fried Chicken |
|---------------|------------------|-----------------|-------------------------------|
| 30.84 | 35.12 | 461.0375 | 30.84 |
| 31.00 | 67.775 | 463.2875 | 31.00 |
| 154.57 | 70.245 | 466.0375 | 35.02 |
| 457.55 | 71.105 | 468.2875 | 170.305 |
| 479.250 | 154.49 | 469.5125 | 151.685 |
| | | 154.58 | 151.805 |
| | | | 464.0125/ |
| | | | 469.0125 |

Taco Bell

| |
|----------|
| 30.84 |
| 154.57 |
| 465.8875 |

Wendy's

| |
|---------|
| 33.16 |
| 33.40 |
| 154.515 |

Burger King

| |
|----------|
| 30.84 |
| 457.55 |
| 465.8875 |
| 467.775 |

Grab your coat. Our next stop is the home of Lou Gabrielson, in **Amityville, New York**. According to Lou, the following Amityville frequencies do not appear in frequency books. (Not all of them agree with Harvey Bernstein's list, either. You decide.)

| | |
|---------|--|
| 33.10 | Highway Dept. |
| 45.20 | Fire |
| 45.50 | Fire/Police auxiliary |
| 45.58 | Fireground |
| 153.83 | Fireground |
| 154.115 | County District Attorney |
| 155.32 | Ambulance to Hospital |
| 155.58 | Police (same as 6th precinct but low power) |
| 159.15 | Car to car |

DON'T PANIC...



...if you haven't received your *Monitoring Times* by the beginning of the month. Postal delays do occur, and we must wait until the 10th of the month before sending replacements for lost issues.

Be patient and wait until the 10th; if you still don't have your *MT*, call us at 1-800-438-8155 and we will be happy to send a replacement.

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(continued)

That's enough of winter. Grab a light weight wind breaker; we're headed for **Benicia, California**. The following frequencies were provided by Mike Owyang.

| | | | |
|---------------|--|----------------|--------------------------------------|
| 42.02 | California Highway Patrol (CHP) mobile | 155.97 | Vallejo Police |
| 42.60 | CHP base | 156.00 | Solano Fire |
| 151.415 | Fish & Game | 461.3375 | Marine World Africa security |
| 151.925 | Marine World Africa Theme Park | 461.575 | Marine World Africa operations |
| 154.905 | CHP mobile extender | 461.7375 | Marine World Africa operations |
| 155.40 | Medical Net EMS | 461.9625 | Marine World Africa show productions |
| 155.49 | Solano Sheriff | 482.9875 | Vallejo Fire |
| 155.91 | Vallejo Police | | |
| 155.94 | Benicia Fire | | |

If you're looking for a way to extend the summer season, you'll love our next stop. Welcome to **Walt Disney World, Florida**. The anonymous contributor claims that Walt Disney World is moving the majority of its radio communications to 800 megahertz. The frequencies listed below, he says, are still in use.

| | | |
|---------------|---------------------------|---|
| 453.825 | Fire Dept. | Old Frequencies Not Used |
| 461.70 | MGM | 461.30 462.775 |
| 462.475 | Monorail | 461.60 464.06 |
| 462.575 | Operations | 462.250 464.80 |
| 462.625 | Operations— Magic Kingdom | 467.250 |
| 462.65 | EPCOT | |
| 464.20 | Landscape | |
| 862.55 | Operations | |
| | | New 800 Megahertz Frequencies, not identified. |
| | | 851.3125 853.4625 |
| | | 852.2375 854.7875 |
| | | 852.7375 |

Florida monitors with Disney updates are encouraged to contact the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Listeners living throughout the U.S. are also invited to send in their favorite frequencies.

Computer Corner

Here's a frequency "Grab Bag" that you can't afford to miss. I'm offering three separate items on one 3.5 disk. Here's what I have: (1) The popular Radiolog shareware program. As most of you know, Radiolog is easy to use and it can store, sort, and print thousands of frequencies; (2) 140 pages of railroad frequencies for cities throughout the nation; (3) An extensive listing of federal frequencies that are used throughout the nation.

To receive the disk, send a formatted, high density, 3.5 disk with return mailer and postage to Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If you don't want to provide the disk, mailer and postage, I'll copy the three items onto a disk, lick the stamps, and send it to your doorstep for \$5.00 dollars.

Scanner Tips

In League City, Texas, burglars utilized two way radios to coordinate the burglary of a drug store. The conversations between the burglars were monitored by two sleepless scanner buffs on 154.60 MHz, at approximately 3:30 am.

The first listener called police to report the robbery. When the

police arrived, they arrested a person sitting in a van on suspicion of burglary. When a second scanner buff provided a tape recording of the crime, police identified the voices and charged several suspects with burglary of a building.

Radios Flunk the Breathalyzer Test

In New Jersey, a "driving under the influence" citation was overturned because police failed to take precautions to keep radio waves from interfering with the test.

Ten years prior to the incident, the New Jersey Supreme Court ruled that police could use the model 900 breathalyzer so long as police banned the use of walkie talkies from the test area. In municipal court, one officer testified that his radio was off, but other officers were not certain about hand-held radios that were in the test area.

The judge ruled that if the defendant were charged with driving under the influence, the charge must be supported on evidence other than the breath test.

Cordless 900

The new 900 cordless phones operate between 902 and 928 megahertz. Since frequency usage varies between manufacturers, most folks simply search between the lower and upper frequency range and note the frequencies that are active.

Unlike the 46/49 MHz band, there are no specific operating frequencies for cordless phones that operate in the 900 megahertz range. The entire 902 to 928 band is open to a variety of signals. Did you know that the nationwide calling frequency for amateur radio operators in the 900 megahertz band is 902.10 MHz? Hams share the frequency with a variety of lower power gadgets for home and commercial use.

Attempting to isolate active frequencies within the 900 band can also be frustrating. Cordless manufacturers are producing phones that have the ability to skip between several dozen frequencies. The feature won't prevent you from hearing the action, but it does present a problem if you're bent on listening to specific frequencies.

It also makes little sense to isolate the operating frequencies for specific models. Sure, you can list every frequency that a particular phone might use, but unless you're trying to monitor a single make and model, it's a wasted effort.

The best way to monitor the new 900 cordless phones is still to simply search between 902 and 928 megahertz and resist the urge to monitor specific frequencies.

Caller ID

Caller ID is available in Hillsdale, New Jersey. This service allows the called party to visually see the phone number of the caller. According to Dr. John Griffin, however, a caller can shield his or her phone number by dialing *67 prior to dialing the phone number.

Persons utilizing caller ID can also program their phones to reject calls from those who shield their numbers. The person calling will get a recording explaining that their shielded call cannot be accepted.

If Caller ID is active in your neck of the woods, let us hear from you. Send your Caller ID comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Next Month

Give someone a gift that lasts an entire year—a twelve month subscription to *MT*.

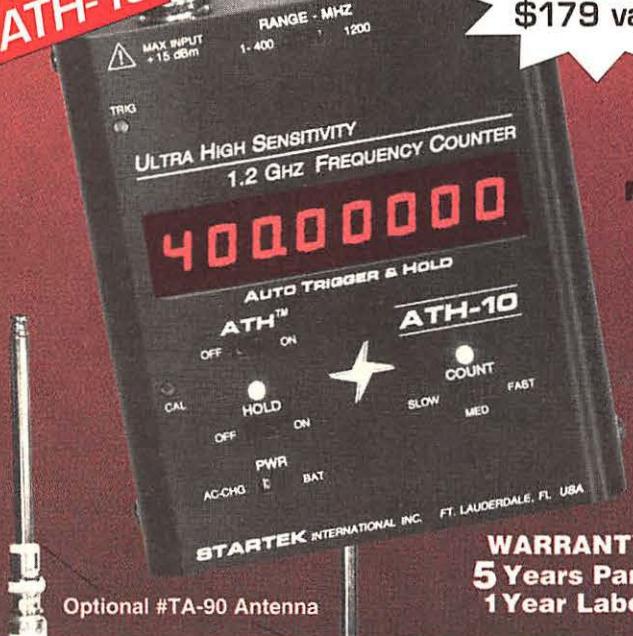


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|--------------|---|-------|
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| #TA-90 | Telescope BNC antenna..... | 12. |
| #TA-90-L | Telescope Elbow BNC antenna | 16. |
| #RD-150 | 150 MHZ Rubber Duck antenna..... | 16. |
| #RD-2750 | 27 & 50 MHZ Rubber Duck antenna..... | 28. |
| #RD-450 | 450 MHZ Rubber Duck antenna | 16. |
| #RD-800 | Cellular phone band RD antenna..... | 29. |
| #C/6A | ABOVE 7 items, SAVE \$30...99. | |
| #M-207-IC | Interface Cable MFJ ant. analyzers..... | 10. |
| #P-110 | 200 MHZ 1X-10X probe | 39. |
| #LP-22 | Low Pass, Audio probe | 25. |
| #DC-10 | Direct, 50 OHM probe | 20. |

FEATURES

| | ATH-10 \$149 reg \$179 | ATH-15 \$189 reg \$235 | ATH-30 \$249 reg \$299 | ATH-50 \$289 reg \$339 |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|

| | | | | |
|---------------------|------------------|------------------|------------------|-----------------|
| FREQUENCY RANGE | 1 MHZ - 1200 MHZ | 1 MHZ - 1500 MHZ | 1 MHZ - 2800 MHZ | 5 HZ - 2800 MHZ |
| AUTO TRIGGER & HOLD | YES | YES | YES | YES |
| SIGNAL BAR GRAPH | NO | YES | YES | YES |
| LOW BATTERY IND. | NO | YES | YES | YES |
| ONE-SHOT & RESET | NO | OPTIONAL | YES | YES |
| HI-Z LOW RANGE | NO | NO | NO | YES |

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|---------|----------------|---------|----------------|
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Stop, Thief!

It was like something out of a Three Stooges movie. I had gone into my office on a Monday morning to wade through a pile of paperwork left over from the previous week. (I swear it breeds and grows over the weekend.) While plodding through the various proposals and planning statements, I like to listen to the local jazz station on FM. For this reason I keep a low cost radio on my desk at work. Or I should say, "kept." That particular day I reached up to turn the radio on and found myself trying to dial in empty space. Some person or persons unknown had decided to lift my radio over the weekend. I must have made quite a picture trying to tune in a radio that wasn't there. Why anyone would want to take what amounts to a ten-dollar bargain basement AM/FM rig with a scratchy audio gain potentiometer is beyond me. I guess they figured they needed it more than me.

Since I was not severely out of pocket by this theft, I decided to chalk it up to experience and recover my losses by turning the whole mess into a column. (Now you know where all my great ideas come from. The point of this exercise is that the radio that was stolen could have been more valuable. So how can radio hobbyists protect themselves from radio rip-offs?

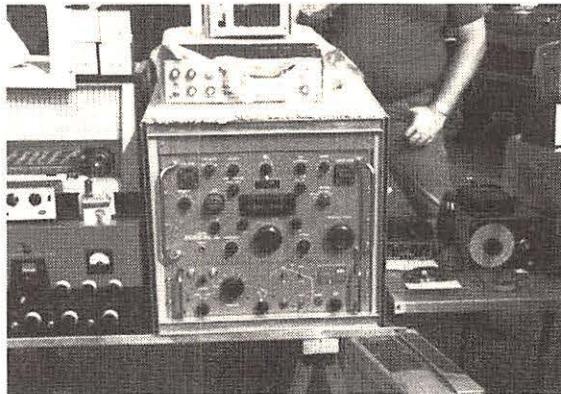
My search for ideas began at my local constabulary. In addition to providing exciting action for you to tune in on your scanner, your local police department can provide you with tons of information about protecting you and yours from theft.

Let's start by assuming the worst. One of your radios has been stolen. A side effect of the increasingly portable nature of our hobby is that radios can easily "disappear" from desks, briefcases, cars, etc. Taking steps to identify your equipment will go along way in making recovery possible. It can even serve to deter a dirtball or two if it is obvious enough.

Electric Pencil

Head out to your local hardware outlet and pick up a low cost electric engraving tool. One of these units should cost between \$10 and \$15. It is worth every penny. Use your electric engraver to carefully carve some appropriate identification information on your radio or other thievable item's case. Before you go writing on your rig, practice on a couple of pieces of scrap plastic and aluminum. Once you get the hang of an engraver it is easy to use, but initially they tend to get away from an inexperienced hand.

Okay, what are you going to write on your radio that will send terror into the hearts of any thief who sees it? Start with the obvious. Carve your name into the rig. Next, I always engrave the radio's serial number, since this is usually only stuck on the equipment in the form of a piece of plastic or metal tape that is all too easy to remove. Then



At sixty pounds, the R390A is as close to theft-proof as radios get.

I usually provide overkill and include my amateur radio call sign and my social security number. Some folks include their driver's license number if it's not too long.

The point of the exercise is to give enough personal identity to your equipment so that someone might think twice before trying to walk off with it. If they do walk off with it anyway, it gives law enforcement some clues to match up the stolen merchandise with its rightful owner.

Okay, I know what you're thinking: this kind of action severely affects the esthetics of your gear and also presents some potential problems

if you ever plan to sell the equipment. I can't really argue with these facts, but the reality is that you have to do what you can to prevent your gear's theft and to assist in its recovery if it ever does get stolen. As for esthetics, do your engraving on the back or the bottom, maybe even inside the battery case if you have enough room. This will keep things relatively good looking.

You can get around the resale problem by presenting the new owner with a bill of sale relinquishing all your rights to ownership of the piece of equipment. This would serve to prove to folks why he or she has something with your name on it. Besides, if the gear is stolen and "returned" to you, you can easily get it back in the hands if its current owner.

Smile for the Camera

Now that you have all your gear properly engraved, run down to the drug store and get a roll of film for your camera. Take individual pictures of each piece of equipment. These don't have to be studio portfolio quality. All you want to do is make sure the equipment is easy to recognize in the photo.

When you get the pictures back from the developer, prepare for writer's cramp. On the back of each picture write down the equipment's name, model and serial number. Add to this the piece of equipment's dimensions because pictures don't always communicate actual size. Also list where you engraved the item and what you engraved on it. Finally, list the value of the item. If anything does come up missing, these pictures and essential facts are just what law enforcement needs to attempt a recovery. These items will also help you figure out things for your insurance company.

Some folks like to go a step further and make a video tape of their equipment, complete with running commentary. This is probably of limited use, because the police can't easily reproduce and carry around a video tape while they are on the job. True, it is yet another form of identification, but do it in conjunction with the engraving and photographs, not in place of them.

Did Someone Say Insurance Companies?!

While we are on the subject of insurance companies, you need to contact yours and make sure your gear is covered. In the height of the CB boom of the 70's, many insurance companies expected people to get special "riders" to cover personal radio equipment, especially if the equipment was portable or automobile mounted. There is no standard practice today—coverage varies widely, so it may be worth a call to your agent to check things out for yourself.

If you are a member of the American Radio Relay League (ARRL) you can take advantage of a radio equipment insurance program that they provide for their members. You can get more information by writing The American Radio Relay League, 225 Main Street, Newington, CT 06111-1494. The *W5YI Report* says a new group, Ham Radio Insurance Associates, Inc (P.O. Box 201, Canonsburg, PA 15317) also insures radio/computer equipment.

Let's Get Serious

Now that you have marked and identified all of your equipment, let's take a look at keeping it from getting stolen in the first place. We had better start with the obvious.

Never, never, never leave your equipment where someone can steal it. I know; that is really obvious all right. But you will be surprised how many times I've heard things like: "I just put it down for a minute." "I only left my desk to get a cup of coffee." "It was too hot to roll the windows up on the car for such a short stop." Get the picture, Compadre? If your rig isn't locked up and out of sight, you may as well just hand it to the thief. The few seconds of inconvenience required to lock up your equipment out of plain sight is sure less hassle than filling out a theft report. If someone wants to steal your gear, don't make it easy for them.

If your situation in life does not allow for easy locking and hiding away, you might want to invest in one of those cable locks designed to keep computers and typewriters from walking out of people's offices. They are relatively inexpensive and are available at most computer and office supply houses. Basically, they work by providing a hard-to-remove device for running a cable and lock through. The idea is that thieves don't usually have the luxury of time while they are doing their dirty work. If you create a situation where it is going to take them too long to steal your gear, hopefully they will leave it alone and move on to something else.

How's Your House?

Entire books have been written on home security. Mostly they boil down to a few simple notions. Put "deadbolt" locks on your doors. Put "jimmyproof" locks on your windows. Get a "loud barking" dog. Most burglars today are of the "bash and grab" variety. They wait till nobody's around, kick in your door, and grab all the stuff they can fence in about a minute. Then they get out before the cops have time to respond to any alarm system you might have rigged up. Strong doors and deadbolt locks might just slow down a burglar enough to make him move on to easier pickin's. Again, a talk with your local

authorities will guide you toward the best way to prepare your abode against ravaging barbarians.

How's Your Car?

Bash and grab tactics apply to cars, too. If the bad guy sees an interesting piece of gear in the dash, a brick through the window and a deft hand with a crowbar is going to get the thieves whatever they want. So the obvious solution is not to leave anything where people can see it. If your equipment is locked in the trunk, your car is less likely to attract the wrong kind of interest. Some modern mobile ham gear is designed to be operated from a trunk or under-the-seat location. All the controls reside in the microphone or in a snap-off dash panel that can easily be thrown in the glove box when you get to your destination.

The best solution of all might be the latest wave of handheld receivers and transceivers. Regardless of what aspect of the radio hobby gets you excited, modern microcircuitry has allowed someone to market a handheld hobby device for your area of interest. By using this type of equipment, you don't even have to leave your rig in your trunk. You can just clip it on your belt and get on with your life.

Truth Stranger than Fiction!

I had a friend who liked to do his DXing with a Collins R390A surplus receiver. The R390 is a great rig with only one drawback. It weighs in at about 60 pounds. This friend of mine lived in an apartment in what could best be described as a "questionable" urban environment. He came home from work one night and found his apartment totally cleaned out, right down to the roll of toilet paper next to the hopper. Everything was stolen, they picked him clean . . . Except . . . They left behind the R390. It was old enough and heavy enough that they couldn't be bothered with it.

Is the moral of this story that heavy gauge surplus is the best way to theft proof your shack? Well, it worked for him! Be careful, folks. And have fun!

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Struck Speechless

In Papua New Guinea, which experienced a major volcano eruption toward the end of September, Rabaul stayed on the air late, and then had to go silent as they left with the other evacuees; NBC was heard at 2000-0700 on 9675, then 4890 kHz carried lots of messages, according to a report by Arthur Cushen of New Zealand.

The VOA's silencing of the Bethany, Ohio, site, is a man-made closing. The Cuban-American National Foundation was understandably upset when told of the planned closing, since it was the Bethany site which had beefed up Martí broadcasts. In two lobbying trips to Washington, engineer John Vodenik and others visited many senators and congressmen and their staff, hoping to delay the VOA/RFE/FL

consolidation past recess before elections. VOA is top-heavy with managers who are not broadcasters at heart, says Vodenik. Relying on overseas relays is risky—VOA Sri Lanka is surrounded by military guards to prevent takeover by losing party in recent election. The "friendly" Philippine government took back part of an antenna field, so VOA has to replace two antennas. However, VOA Asst. Dir. Joe Bruns made it official: Bethany will close, the staff are receiving notices Nov 1, and are to be out by Jan 4; black-bordered last-day QSLs will be issued; please send 2 IRCs or \$2 for costs to John Vodenik, 104 S. Forest Ave., Mason, OH 45040 (John Vodenik, OH) Listen to *World of Radio* for news regarding the last day broadcast.

ALGERIA R. Algiers Int'l, English 1600-1700 on 17745.2, with jazz, news, barely audible but in the clear weekdays when Portugal is not dominating frequency (Brian Alexander, PA)

ANGUILLA Defunct KGEI's newer antenna goes to Dr. Gene Scott's new SW here (A. Peterson, *Radio News Bulletin*)

AUSTRALIA Australian Defence Forces Radio changed to: Malaysia, one hour at 0100, 0430, 1000 on 13525 USB; to Rwanda from NWC, at 0800 on 15606, 18191.5, 1400-1600 on 10621.5 and 8743 (Radio Netherlands *Media Network*)

BANGLADESH Dhaka in English at 1745-1815 on 7190 and 9647 ex-9688 (Rumen Pankov, Bulgaria, via Wolfgang Büschel)

BELARUS Minsk has new weekly English, Tue 1845 on 6010, 6020, 7210, 11960, presumably shifting to 1945 (BBCM via RNMM) Maybe also to us at 0045 on 7150? See Oct.

BELGIUM RVI, W-94 in English to us: 1400 (Sun 1330) on 13675, no longer a parallel to Asia then; 0300 on 6035, and S. America 9930 (via Steven Cline, Diane Mauer, Bob Thomas) 13675 clashes with Dubai unless they moved (Cline and Brian Alexander)

BENIN Altho ORTB was previously reported missing from 4870 on one occasion, there are many reports of it since including: several times in French between 2100 and 2300* (Kevin Hecht, PA)

BOSNIA-HERCEGOVINA R. Yugoslavia has two sites, Stubline in Serbia, and just a few miles away Bijeljina in Bosnia. But the latter is under BoSerb control. Despite break in relations, no change in broadcasts. Two 500 kW at Bijeljina still carry programs from both sides, per Montenegro newspaper (Chris Greenway, BBCM via RNMM)

BOUGAINVILLE Shortly after peace settlement, a PNG station began from here on 3875, until 1300* all in Pidgin, UT+10 time, and PNG anthem; quite strong, and R. Free Bougainville no longer heard on 3880 (Arthur Cushen, NZ) RFB was changing from 3850 to 3855 at 0830-1030 (Sam Voron, IARN via John Norfolk)

BRAZIL DW relay for W-94: 2300-0050 in Spanish on 11810; 0100-0300 in German on 6075, 9640; both using 2 x 250 kW. DW uses up to four transmitters at different sites on 6075 at different times (Wolfgang Büschel, Germany)

CAMEROON Garoua, 5010 has English news 2100-2115 (Bob Padula, *Australian DX News*)

CANADA In early September, CFCX on 6005, Montreal, ceased



All times UTC; all frequencies kHz. *Asterisk before/after time station sign-on/sign-off; // parallel; + means continuing but not monitored; = 2 x indicates 2nd harmonic of following frequency.

(Fernando Viloria, Venezuela, via Santiago San Gil)

COSTA RICA To replace 21465, RFPI has been trying 17905 USB afternoons; also tested 15050-USB in addition to 15030-AM, 9400-USB, 7385-AM. For fourth quarter, *World of Radio* remains at: Fri. 2000, Sat. 0400, 1200, 1800, Sun. 0200, 1000, 2300, Mon. 0700, Tue. 1900, Wed. 0300, 1100. When tape arrives by Thursday and some other program is late, *W.O.R.* may be inserted, such as at 2230. For 12 weeks each starting Oct. 4, two University of the Air courses are running: *Journey of the Mind Through the Ages* with Prof. Winifred Grace Barton, Tue. 2230, repeated Thu. 2300 and Wed. 2230 rep Sat. 2300; and *Well Mind, Well Earth: Education for Integrity* with Dr. Michael J. Cohen, Tue. 2300 rep Thu. 2230, Wed. 2300 rep Fri. 2300; also available via tape. For info on costs,

content, registration, write PO Box 20728, Portland, OR 97220; fax 503-225-5216; phone 503-252-3639.

On RFPI's wish list: a 70-kW generator to compensate for local power outages; antenna switching mechanism. Has full-time staff of five plus interns and volunteers; many callers to anniversary *Fiesta* asked for more programs about Costa Rica. Spanish weekdays expanded to 1300-1700, so English programs previous day only at 1700-2100 get second repeat 0900-1300. Working on grants to get 100 kW transmitters in long term. *Far Right Radio Review* planned to try monthly live call-in on special UT Sat 0230 edition with 800 number, presumably 404-RFPI, such as Oct 8 (RFPI *Fiesta, Mailbags*)

CROATIA Zagreb much stronger on new 13640 than // 13830 at 2005 (Joe Hanlon, PA & gh)

CZECH REPUBLIC R. Prague's existence is up for review. It's unknown whether they'll be active next year. This is mentioned regularly on their broadcasts. It's probably a good time for listeners to write in supporting the station's efforts. It may have a bearing (Bob Thomas, CT) US Congress and Senate have approved RFE/RL moving from Munich to Prague (Czech press reports via BBCM) Labor cost in Prague will be one fourth what it was in Munich, dropping operating costs from \$208 million to \$75 million in 1996, says Bonnie Mihalka, RFE/RL spokeswoman; broadcasting from Prague expected to start June 30, 1995 in all 21 languages (Andrew Borowiec, Washington Times via Chet Copeland) Token rent of 3 cents per day (David Rocks, Miami Herald via Aaron Pilchick)

ECUADOR New station Good Shepherd Radio expected on 4815 by March; antenna of double-lazy-H design for vertical radiation has been installed, 1 kW Collins modified AM transmitter, waiting on studio construction and license. Is at Saraguro, to serve people speaking that Quechua dialect for first time; missionaries recently made inroads thanks to cholera outbreak (Claude Beechy, HCJB DX Partyline) HCJB helped fix severed cable, put R. Interocéánica, 4840 back on air. HCJB's 30-kW SSB moved from 21455 to 17490, reports wanted, but 21455 maintained as propagation beacon using sesquikilowatt Gates SSB, special QSL (HCJB DXPL)

EQUATORIAL GUINEA F. Africa back on 19m after many years on 41, 15190 with gospel in English at 0730, 2200-2300* (BBCM)

ETHIOPIA VOE dropped Amharic in external service, moved English to 1600-1700 on 9460, 7165 (BBCM)

FINLAND YLE W-94 to us: 1230 on 15400, 11735; 1330 and 1430 on 15400, 17740 (YLE & Joe Hanlon) Also English audible at 2330 to Latin America on 9615 (Hanlon & gh)

FRANCE RFI with no English at start of W-94 (Joe Hanlon, PA) Next day announced 13625, 15530, 17575 at 1200 but this and other foreign languages on strike (gh)

GEORGIA unID regional service on 7108 at 0330-0430 & 1200-1400, weak with Caucasian language and music, must be Abkhaz Radio (Rumen Pankov, Bulgaria, via Büschel)

GERMANY Larry Wayne retired again from DW with his final *Random Selection* Sep 26; we'll miss him! N.Am. weekend schedule at 01, 03 and 05 adjusted to: UT Sun, *Inside Europe, Deutsch: Warum Nicht?* UT Mon, *Mailbag*, (except *World DX Meeting* last weekend of month), *Living in Germany, Deutsch: Warum Nicht?* Over the years, four Jezzies (*Katz What Am*) had Larry (gh) Asian service at 0200 via Portugal now good here on 6130 (Joe Hanlon, PA) Radioropa Info, Daun, 24 hours on 5980, or alternate 5975 in German; has national news at :15 and :45, international news at :00 and :30, also on satellite, a commercial station (BBCM) No mention here that SW site is in Czech Republic (gh) actually 0400-1500 on 5980, 1500-2200 on 5975 (Eugene, RVI *Radio World* via Cline)

GUAM AWR-Asia, KSDA W-94 shows only three English hours, but all now daily: 1500 and 1600 on 9370, 2300 on 11980 (via Peterson)

HONDURAS Drought led to hydro power shortage and rolling

blackouts, 6 hours on, 6 hours off, likely affecting smaller stations without generators (Don Moore, *Radio Nuevo Mundo*) That was in August; better in September as R. *Internacional*, 4930.6, no longer mentioned having to use emergency power (Henrik Klemetz, Colombia) Sani R., reactivated after 2 years absence, on 6299.22 at 0110-0303* ads, jingles (Brian Alexander, PA) R. Copán, 15675, *Mailbag* now done by Dave Williams 2nd & 4th Sat 2200 next to his own *Radio Waves* at 2215—but first week running late, so *Waves* was bumped. He says it's fine for a Nazi to be on WRMI, but criticizes gh's criticism (gh)

INDONESIA During visit here, I heard RRI Banjarmasin with news in English at 0930 on 3250, not // 5970. Also visited VOI in Jakarta; note that their address is now PO Box 1157 in Jakarta (Maarten van Delft, *World of Radio*)

IRAN (non) V. of Mojahed, from Iraq 1720-1750 on new 4460, 4725, 5445, 5485, 7000, 7060 and others. V. of Human Rights & Freedom for Iran, from Egypt on 9350, 11470, 15145 all drifting, 0240-0455, 0600-0638, 1630-1825 (Rumen Pankov, Bulgaria via Büschel)

IRAQ (non) Republic of Iraq Radio, Voice of the Iraqi People, clandestine reportedly from Jiddah, Sa'udi Arabia, 1300-0100 in Arabic on 15135v, 13670v, 9570, 9560-alternate (BBCM) V. of Iraqi People, in Arabic from Sa'udi Arabia, 1200-1350 on 15683, 16085, 1400-1900 on 7115, 9560; only jamming heard on 16085 (Rumen Pankov, Bulgaria via Büschel) V. of Rebellious Iraq, 7070v has shifted an hour later for winter, approx: 0430-0700, 0830-1030, 1200-1520, 1600-1830 (BBCM)

ITALY R. Mariquita, new on 4115 with musical programs, multilingual IDs expected, heard v2000-0100v, report c/o GAMT, PO Box 3, Suc. 10, I-31100 Treviso; one IRC or US\$ appreciated (L. Basso, Treviso, *Play-DX*)

JAPAN R. Japan General Service in English changes made Sept. 25 include: to N. America 0100, 0300 and 0500 on 9565 ex-9680; 0700 Gabon on 15335 ex-15380 (R. Japan *Media Roundup* via John Norfolk) From Oct 31 expect usual RCI relay switch on 5960 from 0100 to 0300 (gh)

KAZAKHSTAN R. France Internationale's mailbag program announced relays added to Mideast/Asia via Almaty (George Thurman)

KOREA SOUTH RKI's new 250-kW transmitter is being used on 7275, non-directional, 0215-0400, 0800-1500, 1600-2345 (Tooru Yamashita, RJMR)

KURDISTAN R. Irana Kurdistana from Iraq on new 4290 0200-0400, 1600-1800 (Rumen Pankov, Bulgaria via Büschel)

LITHUANIA (non) R. Vilnius W-94 0000-0030 on 7150 ex-9530 via Russia, all English UT Sun & Mon, back to ham QRM (gh)

MONACO TWR, English to UK changes 23 Oct. to 0740-0920 (Sat. 0935, Sun. 0945) on 7110, ex-7385 (via Gigi Lytle, Wolfgang Büschel) So ends the overlap clash with RFPI

NETHERLANDS R. Nederland has dropped French and Portuguese, and previously Arabic, but Indonesian continues, along with Dutch, English and Spanish. (RNMN and *Radio-Enlace* via Mauer, Moats, Cline, Hecht)

DX Listening Digest

More broadcasting information by country compiled
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NEW ZEALAND

Print Disabled Radio, Levin, finally on long-awaited new 5960-USB+carrier, heard at 0545 readings mixed

DW, 0550 clear, 0600* off abruptly (Craig Seager, NSW, Australian DX News) RNZI from Oct. 1: 1650-1850 on 9655, 1850-2050 11735, 2051-0715 15115, 0716-1206 9700. Occasionally for sports or cyclones 9700 to 1306, 9655 1307-1650. 15115/9700 switchover time varies at weekends due to domestic programming breaks (Adrian Sainsbury, RNZI *Mailbox*) Kiwi Radio, 7455 USB, Hastings Napier area, busted by Commerce Commission during its 17th birthday broadcast Sep 6 (Arthur Cushing, *World of Radio*)

NORWAY R. Norway, W-94, English on Suns. + UT Mons., initial sked: 0800 15175, 1200 11850, 15165, 1300 9590, 1800 7120, 11940, 1900 5960, 7215, 9590, 1314; to Americas 0000 6115 S. Am., 6120 N. Am., 0200 9560, 0500 5905 (Olav Grindalen, NRK via Bruce MacGibbon, RJMR) Out-of-band for first time due to low sunspot band congestion, also 5905 at 0100 and 0200, 5910 at 0100, 9480 at 1500 (Grindalen via Joe Hanlon, PA, *W.O.R.*)

PARAGUAY SW situation here: 6025.0, R. Nacional inactive for two years, with 5 kW transmitter running 1 kW, plans to move to 25mb, probably 11955 and increase to 8 kW. 9735.1, R. Nacional at 0745 (Sun. 0845)-0400, 100 kW Harris running at 40%. 11940.0, R. Encarnación, with 500-W Paraguayan Telectron transmitter, now simulcasting MW 0755-0400 daily. 15210.0, R. Cardinal AM stereo plans to commence new SW service here, Ex-R. Guarani frequency, but as of last Feb. had license but no transmitter. Inactive for years: 5935, 5995, 6014.9, 6110 (Takayuki Inoue Nozaki, *Relámpago DX* via RNM)

PERU R. Tayacaja, 5049.7 at +2300-0000+, and R. Municipal Cangallo, 5050.5, testing from *2350 both audible in temporary absence of Ecuadorian (Henrik Klemetz, Colombia) Latter heard past 0100. R. Nor, Peruana, Chachapoyas, on 9660.4 ex-9655 at +1500-1700+, strong interference from Rumbos, Venezuela, 9660. Estación Láser, Rioja on 4538.0v ex-4705 +2300-0015+ (Klemetz, *Play-DX*) unID with Tingo María ads, nonstop music on 8324.1 at 1527-1611 (Rich MacVicar, Ecuador, HCJB *The Latest Catch*)

PORTUGAL The two-year old RFE/RL/VOA relay at Maxoquera, 6 x 500 kW, is not in the W-94 schedule, maybe mothballed (Wolfgang Büschel, Germany)

RUSSIA Checking the feeder list in our Feb. column, only 16299.96 could be heard, 1330-1430 Radio Rossii, very good on USB (Chuck Bolland, FL) Starting W-94, R. Moscow dropped ten languages from Europe, Africa, Asia, down to 36 total (RJMR via Mauer, Büschel)

RWANDA (and non) DW hoped to resume some relays from here in Oct. with two of four transmitters once main electricity supply was back; from August ran national service only on 6055 with Diesel generator; four German technicians had returned and 15 of former 50 local employees engaged again. All technical facilities intact and in good shape, but private houses plundered (Peter Sänger, DW on ORF *KW-Panorama*, via Büschel) R. Gatashia, from a hill near Bukavu, Zaire, on 6120 at 0700-1000, 1400-1700, strictly neutral programs, UN and ICRC financed (F1TAY via Büschel) R. Amahoro via Gabon, Ethiopia as in Oct. p. 47, gives address as Amani (?) Centre, Rue du Noye 332, 1040 Brussels, Belgium; sponsored by non-profit organizations including Amnesty International which had operated in Rwanda, took refuge in Europe (BBCM)

SEYCHELLES FEBA S-94 until 5th Nov. shows only two frequencies for English at 1500-9810 at 1458-1600; and 11870 at 1458-1555 (Sat. 1550, Sun. 1558); also Fri. 0457-0552 on 17725 (gh)

SWITZERLAND Most of SRI's features at 0430 are re-runs of weekend features of years ago. Announcers have been house-trained not to give address or ask for feedback. I find SRI very sad! They have the ability



to do good work and it shows every once in a while, but most broadcasts are boring, poorly presented and not considerate of audience needs. (Larry Nebron, CA, USENET via Thurman) SRI W-94 via French Guiana in English: 0100-0130 and 0400-0500 on 9905; 0900 on 9885, 2000 on 9770; Gabon relay only on 6135 at 2000-2200 starting with English and to be cancelled at year end. All overseas broadcasts except 1300-1445 use 9885, from Switzerland direct except as above. New 6205 at 1700-1845, 2215-2400. Beijin relays 1300-1445 starting with English are on 7480 and new 7250 (Swiss Telecom)

TAIWAN (non) Little change in VOFC relays via WYFR except to Europe, 2200-2300 W-94 on 5810, 9850 (gh)

TURKEY VOT W-94 in English: 1330-1400 SW Asia on 9675. 2100-2200 Europe on 9400. 2300-2400 Europe on 11710, ME on 7185, N. Am. on 9445. 0400-0500 N. Am. on 9445 (TRT) actually 50 minutes at 21, 23, 04

UKRAINE RUI retimed to 0100 in English, heard on 7150, 9685 (Joe Hanlon, PA)

UAE Abu Dhabi, English 2200-2400 on 11885, 9770, new 9605 (Brian Alexander, PA)

USA WORLD OF RADIO as expected after DST ends Oct. 30: WWCR: Fri. 2215 on 15685, Sat. 0700 on 7435, Sun. 0500 on 7435, 0700 on 5810, Mon. 0000 on 7435, Tue. 1330 on 15685; WHRI: Fri. 2301 on 7315, Sat. 0600 on 7315, 9495, Sun. 0130 on 7315; KWHR: Sat. 0600 on 9930, Mon. 0330 on 17510. See also COSTA RICA.

WWCR -3 replaced 15610 with 17525 for *Worldwide Country Radio* 1600-2100; plan to move 5810 to 5890 evenings delayed. *Spectrum* got repeat UT Mon. 0400 on 5810 in addition to Sun. 0200; if still in effect, one hour later during standard time (gh) WWCR risking suits, license denial by running Kurt Saxon—a man in New Zealand shot 13 people and himself after getting ammo info from him; and Saxon has broadcast detailed instructions on making fire-bombs (James Latham, RFPI *FRRR*)

Prophecy Countdown revealed that they had again failed to raise the \$5 million to purchase WCSN by another deadline, Aug. 31. The amount was due in an escrow account to avoid default, but once again Christian Science Church OKed a delay until mid-November, by when the total is due and must be borrowed if not raised; FCC license transfer also expected second week of Nov. (gh) Pastor John Osborne also reported log-periodic will be delayed until spring or summer of 1995; plan to buy a curtain for S. America later, no mention of second transmitter (Jim Moats, OH) Oct 1 was date for P.C. programming exclusively on WCSN, 8 or more hours per day (John Osborne, WVHA) First foreign language Arabic at 1800 Sun/Tue/Thu on 9930. *D-XTRA--letters, DX, and news* planned Tue at 2300 on 7465 (Gordon Simkin, WVHA)

A friend and I checked WEWN, 7425 for neighboring hiss. We hear it on wideband, but eliminated on narrow bandwidth. The "hiss" is probably artifact of inadequate or misoperated receiver, combined with strong signal's sidebands in crowded spectrum (C. Marshall Loring Jr., CA)

WRMI, 9955, continued carrying Nazi programming Sat. & Sun. 1900 in English, German. Jeff White says he was unaware of nature of programming when contracted, but will not cancel it unless Zundel says something in English on WRMI offensive to a large number of people. His previous self-identification as a Nazi and his well-known record in Canada do not matter.

Augmented R. Martí schedule due to Cuban crisis in Sept., mostly via Bethany: 0000-0200 11910, 0200-0300 6190, 0300-0600 6120, 0600-1200 6055, 1200-1400 11730, 9615, 9600, 1400-1900 11740, 1900-2100 11765, 2100-2200 11750, 2300-2400 11950 (John Vodenik via Diane Mauer)

More broadcast auxiliaries monitored by skip: WTOL-TV, ch. 11, Toledo, OH, at 2115 on 26350; WISN-TV, ch. 12, Milwaukee, WI, at 1035 [sic] on 26150; WECT, ch. 6., Wilmington, NC, at 2145 on 25452, all FM (Alan Roberts, PQ, CIDX *Messenger*)

Until the next, Best of DX and 73 de Glenn!

Broadcast Loggings

Gayle Van Horn

SHORTWAVE BROADCASTING

Log of the Month

Welcome to the premiere of a new regular feature. Each month we will highlight one logging, that, in the editor's opinion, is the best logging submitted. Judging will be based on accuracy of frequency, and program details. Loggings may be from international broadcasters, or some rare and exotic catch! DX season has begun, so please send in your loggings!

The first "Log of the Month" goes to Bob Fraser of Cohasset, Massachusetts, who is a consistent monthly contributor. Here is his featured logging:

BRAZIL: Radio Nacional, Radiobras, 1900 UTC, 15265 kHz. Featured programming *Brazilian Panorama*, including a discussion that Argentina plans to levy an import tax to protect their local industries, which unfortunately will affect Brazil's trade.

Thanks, Bob, and congratulations!

0000 UTC on 4930.6

HONDURAS: Radio Internacional. Spanish. Station ID and promo. Frequency quote to pop vocals. Commercial product jingles with phone numbers. (Don Taylor, Green Cove Springs, FL)

0000 UTC on 4915

GHANA: GBC. Station ID, followed by Africa news topics. Usual low modulation, with fair signal quality. (David Williams, Pinson, AL)

0020 UTC on 9540

SPAIN: Radio Exterior Espana. Report that North Korea no longer poses any nuclear threat. (Bob Fraser, Cohasset, MA)

0253 UTC on 9200

SUDAN: Radio Omdurman. Arabic. Station sign-on at 0253. Sudanese anthem to ID and announcer's program information. Holy Koran recitations heard on // 7200. (Frank Hillton, Charleston SC)

0305 UTC on 4915

PERU: Radio Cora. Spanish. Regional talk to Andean folk music and newscast. Peru's *Madre de Dios* heard on 4950 at 1040. Spanish pops and romantic ballads. Tentative ID on Peru's **Radio Ancash** at 0640, 4991. (Taylor, FL)

0310 UTC on 3380

GUATEMALA: Radio Chortis. Spanish. Music program of regional tunes. Guatemala's **Radio Tezultlán** noted on 4835 at 0230; **Radio Kekchi**'s religious programs at 1105 on 4845. (Hilton, SC)

0358 UTC on 5050

TANZANIA: Radio Tanzania. African drum rhythms to time pips signal and time check at 0400. "Radio Tanzania" identification, followed by English newscast. (Sam Wright, Biloxi, MS)

0440 UTC on 4950

ANGOLA: Radio Nacional. Portuguese. Announcer's talk about Launde at tune-in. ID at 0455 to station interval signal and newscast. Station recheck at 2350 on 3375. Portuguese talk to U.S. pop vocals, weak signal on // 4950, 7245. (Wright, MS)

0529 UTC on 4765

CONGO: RTV Congolaise. French. Station ID to African drum rhythms. Poor signal for political speech in unknown dialect. (Williams, AL)

0545 UTC on 5030

COSTA RICA: AWR. Spanish. Excellent signal for talk and music. Station sign-off at 0549, English at 0000. (Williams, AL)

0600 UTC on 7255

NIGERIA: Voice of Nigeria. News about President Mandela, and discussion about "Junk-Journalism." (Williams, AL)

1123 UTC on 3905

PAPUA NEW GUINEA: (New Ireland) Radio New Ireland. Pidgin. Announcer's news items on PNG, barely audible under numerous amateur radio operators. Brief signal peak for pop/rock vocals, DJ's music titles and news update at 1130. Additional check of PNG stations audible this hour; 3205, 3235, 3260, 3275, 3290, 3315, 3345, 3365, 3375. (GVH/NC)

1134 UTC on 3385

PAPUA NEW GUINEA: (New Britain) Radio East New Britain. Pidgin. Country tunes sung in Pidgin! News script at 1140, with interference at 1142 from possible Indo station. (GVH/NC)

1228 UTC on 6070

CANADA: CFRX Toronto. Announcer duo's morning show and sports chat. Traffic update, talk show promo and national news. U.S. news briefs to regional commercials. RCI Montreal audible on 11855, // 9635, 17820, with discussion on Cuban refugee agreement. (Hilton, SC)

1240 UTC on 15195

FRANCE: Radio France Int'l. Update on new French/British airline Air Liberty. Station ID and promo for *Where* magazine. World headlines heard on // 13625, 15325, 17575. RFI noted on 17695 at 1413. *European Sports Roundup* on // 17560. (Fraser, MA)

1314 UTC on 15355

RUSSIA: Radio Moscow Int'l. Station personality Joe Adamov answers

listeners questions on Russia's military, pirate radio, and foreign investors. Audible on // 15455, 15470. (Wright, MS)

1340 UTC on 11900

FINLAND: YLE/Radio Finland. Finnish *Editorial*/program discusses Finnish issue of environmental concerns. Great signal for // 15400. (Sean Smith, Atlanta, GA)

1346 UTC on 13675

UAE: Radio Dubai. *Great Arab Modern Poets* with poetic interpretations. National music to Arabic service at 1355. (GVH/NC) **Radio Abu Dhabi** on 9770 at 2245. (Fraser, MA)

1348 UTC on 15630

GREECE: Voice of Greece. Greek pop vocals to ID/frequency quote. Station sign-off 1552. Station audible on 9395 at 2000 with world news. (Tom Banks, Dallas, TX)

1355 UTC on 15240

SWEDEN: Radio Sweden. Discussion on Swedish politics. Parallel 17870 weaker. Program preview, folk music to interval signal melody. Swedish service at 1400. (Smith, GA)

1405 UTC on 15460

BULGARIA: Radio Bulgaria. International news to editorial on Yugoslav/Albanian foreign policy. National news update on // 17705. Recheck at 1905, audible on 17720 // 9700. (Wright, MS) Program feature, *From School to College* on 11720 at 1930. (Fraser, MA)

1430 UTC on 15355

RUSSIA: Radio Moscow Int'l. *News in Brief* to ID, // 15455, 17760. *Jazz Show* program, featuring Big Band jazz tunes. Recheck at 1520 with // frequencies audible as; 15320, 15425, 17760. Check at 2230 on 15290, with *Audio Book Club*. (Fraser, MA)

1435 UTC on 17840

ANTIGUA: BBC relay. Book narration, on // 9515 (Sackville). Various transmitter sites for // frequencies 9410, 9740, 11820, 11940, 12095, 15070, 15575, 17640, 17880, 21660 to 1445. Promo for *Play of the Week*. Additional BBC check at 1715, audible on // 11750, 12095, 15070, 15260, 15400, 15420, 17880. (Wright, MS)

1450 UTC on 17890

ECUADOR: HCJB. Contemporary Christian vocals, audible on // 17490, 21455. Discussion on "1st Corinthians" to book promo. ID/frequency to time check and *Great Ideas* program segment. (Banks, TX)

1716 UTC on 15070

UNITED KINGDOM: BBC. *Composer of the Month* program, featuring Alexander Borodin. Additional BBC monitored as; 1940 on 12095, 2230 on 9915, *Sports Roundup* at 2245 on 9915. (Fraser, MA)

1910 UTC on 11620

INDIA: All India Radio. Closing national headlines at tune-in. Pop vocal music, on // 9650, 9950. Program comments to instrumental sitar music. Recheck at 2017 on 7412, // 11620. (GVH/NC)

1959 UTC on 9435

ISRAEL: Kol Israel. "This is Israel" to local/UTC time checks. World news to magazine program. Heard on // 7465, 11603. National market report to news headlines. (Banks, TX)

2010 UTC on 15505

SWITZERLAND: Swiss Radio Int'l. Commentary on economics, heard on // 9770, 9885, 13635. Station correspondent reporting from Rangoon, Myanmar, on Thailand/Myanmar border disputes. (Wright, MS)

2240 UTC on 4712.5

BRAZIL: Radio Abaroa. Portuguese. Fair to poor signal during regional morning show. Bolivia's **Radio Centenario** on 4855 at 1040. Moderate signal quality for Andean music. (Hilton, SC)

Thanks to our contributors — Have you sent in YOUR logs?

Send to Gayle Van Horn, c/o Monitoring Times.

English broadcast unless otherwise noted.

Gayle Van Horn

What Time Is It?

At the tone, twelve hours 52 minutes Coordinated Universal Time."

Spend some time bandscanning at 2, 5, 10 or 15 MHz, and that phrase will sound familiar. Known as Standard Frequency and Time Signal Stations, these broadcasts are valuable to shortwave listeners for obtaining accurate time, as well as radio propagation conditions.

The most prominent time signal station in North America is WWV in Ft. Collins, Colorado, and WWVH in Kakaako, Hawaii. Both stations



broadcast propagation and solar activity data at 18 minutes after each hour, as well as marine storm warnings at 8, 9, and 10 minutes past each the hour.

Additional worldwide time signal stations broadcast in Morse code, while others may be heard as only a time pip. CHU in Ottawa, Canada, uses continuous voice transmissions in English and French.

If you have some spare "time," consult your 1994 edition of *World Radio TV Handbook* for a complete list of stations.

AIRCRAFT TRAFFIC

United 902, (Aircraft N609UA/Boeing 767-200/ER) 6640 kHz USB. Full data prepared QSL card verified. Received in 20 days for an English utility report. QSL address: United Airlines, P.O. Box 66100, Chicago, IL 60666. (Steve McDonald, Port Coquitlam, BC Canada)

Canadian 74, (Aircraft C-GCPC/DC 10-30/ER) 4675 kHz USB. Full data prepared QSL card verified. Received in 56 days for an English utility report. QSL address: Canadian Airlines, Chief Pilot (DC-10 fleet), 1 Grant McConachie Way, Richmond, BC V7B 1V1. (McDonald, CAN)

Finnair 134, (Aircraft DC 10-30/Tail # "OH-LHB") 5598 kHz USB. Full data prepared QSL card signed by R. Kaole. Received in 34 days for an English utility report. QSL address: FINNAIR, Mannerheimintie 102, SF-00250 Helsinki 25, Finland. (McDonald, CAN)

New Zealand 90 (Aircraft "ZK-NZW"/Boeing 747-200) 5643 kHz USB. Full data prepared QSL card verified. Received in 13 days for an English utility report. QSL address: Air New Zealand, P.O. Box 73111, Auckland Intl Airport, Auckland, New Zealand. (Mc Donald, CAN)

AUSTRIA

Radio Austria Int'l, 6015 kHz. No data station card, unsigned with thank you note. Received in 32 days for an English report. Station address: A-1136, Vienna, Austria. (John Neves, New York, NY)

BELGIUM

Radio Vlaanderen Int'l, 5910/13655 kHz. No data QSL card unsigned. Station stickers and program schedule included. Received in 123 days for an English report. Station address: P.O. Box 26, 1000 Brussels, Belgium. (Le Roy Long, Edmond, OK; Neves, NY)

SCOTLAND

Stonehaven Marine Radio (GND4), 2780.7 kHz. Full data QSL, signed by W.A. Smith-Radio Officer. Station brochure, BTI network schedule, and personal letter included. Received via air in 269 days total (67 days after follow-up), for 1 IRC (returned), and address label (used). Station address: c/o BTI Radio Station, Donnottar Mains, Stonehaven, Scotland, United Kingdom AB3 2TL. (Mike Hardester, Jacksonville, NC)

SHIP TRAFFIC

Helen Knutsen-LANN4, 156.8 MHz USB (Product Tanker). Photo of vessel received with personal note. Received in 35 days for an English utility report and one U.S. dollar. Ship address: c/o Norwegian Crew Management A/S, Hoffsvien 65, P.O. Box 15, Smestad 0309, Oslo 3 Norway. (Hank Holbrook, Dunkirk, MD)

Doctor Lykes-3ELF9, 156.65 MHz USB (Bulk/Container). Full data prepared QSL card verified. Received in 70 days for an English utility report and U.S. mint postage. Ship address: Lykes Bros. Steamship Co. Inc., 300 Poydras St., New Orleans, LA 70130. (Holbrook, MD)

Perseus-IBRU, 156.45 MHz USB (Bulk Carrier). Full data prepared QSL card verified. Received in 58 days for an English utility report and one U.S. dollar. Ship address: Societa Italiana Radio Maritime, Piazzale G. Douhet 25, 00144 Rome, Italy. (Holbrook, MD)

London Highway-156.65 MHz USB (Pure Car Carrier). Full data letter for 74th Japanese ship verified. Received in 92 days for an English utility report and one U.S. dollar. Ship address: Kobe Kisen Kaisha Ltd., Iino Bldg 1-1, 2 chome, Uchisaiwai-cho, Chiyoda-ku, Tokyo 100, Japan. (Holbrook, MD)

SOUTH KOREA

Radio Korea, 9650 kHz (via Sackville/RCI). Full data "Special QSL" for reception of both

DX Report Edition 100 and the special relay of the Samoa Broadcasting Service. Received in 151 days for Radio Korea air/letter report form. Station lapel pin and program schedule received. Station address: (Hardester, NC)

SWEDEN

Radio Sweden, 9850 kHz. Full data scenery card signed by Eli Adler. Program schedule and station sticker included. Received in 11/12/15/30 days for an English report. Station address: S-105 10 Stockholm, Sweden. (Long, OK: Neves, NY)

STANDARD FREQUENCY/TIME SIGNAL STATIONS

Nat'l Bureau of Standards-WWV, 10.000/15.000 MHz. Full data sketch/station logo card, signed by Engineer-in-Charge. Received in 12 days for an English report and one mint stamp. Station address: East County Rd.58, Ft. Collins, CO 80524. (GVH/NC)

Nat'l Bureau of Standards-WWVH, 10.000/15.000 MHz. Full data color sketch/station logo card, signed by Engineer-in-Charge. Received in 14 days for an English report and one mint stamp. Station address: P.O. Box 417, Kekaha, Kauai, HI 96752. (GVH/NC)

CHU, 3.330/7335 MHz. Full data color portrait card of Sir Sandford Fleming, unsigned. Received in 28 days for an English utility report and Canadian mint stamp. Station address: National Research Council, Ottawa, ONT, Canada K1A 0R6. (GVH/NC)

YVTO, 6.100/5.000 MHz. Full data station logo card signed by Cn. German Romero Ocando. Received in 32 days for an English/Spanish report and 1 IRC. Station address: Observatorio Cagigal, Apt. 6745, Armada 84-DHN, Caracas 103, Venezuela. (GVH/NC)

How to Use the Shortwave Guide**1: Convert your time to UTC.**

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5, 6, 7 or 8 hours for Eastern, Central, Mountain or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC; for example, the BBC's "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 pm Eastern, 4:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station

name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

| | | | |
|-----|-----------------|-----|--------------------|
| am: | The Americas | as: | Asia |
| na: | North America | au: | Australia |
| ca: | Central America | pa: | Pacific |
| sa: | South America | va: | various |
| eu: | Europe | do: | domestic broadcast |
| af: | Africa | om: | omnidirectional |
| me: | Middle East | | |

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

RADIO PROGRAMS

Four times a year *MT* publishes the following list of programs containing news and information relating to shortwave radio. For brevity, only peak listening times are included. Please direct corrections and additions to Jim Frimmel, c/o *MT*.

Sundays

| | | | |
|------|---|------|---|
| 0023 | Radio Exterior de Espana: "Distance Unknown" | 1515 | KSDA (Guam): "DX Asiawaves" |
| 0038 | Radio Vlaanderen Int'l: "Radio World" | 1635 | Radio Koreia: "Shortwave Feedback" |
| 0109 | HCJB: "DX Partyline" | 1725 | Radio Japan: "Media Roundup" |
| 0110 | Voice of America (an/vca): "Communications World" | 2012 | Voice of Israel: "Calling All Listeners" |
| 0123 | Radio Exterior de Espana: "Distance Unknown" | 2023 | Voice of Israel: "DX Corner" |
| 0124 | Deutsche Welle: "DXers World Meeting" | 2038 | Radio Korea: "Shortwave Feedback" |
| 0130 | Radio Havana Cuba: "DXers Unlimited" | 2110 | Voice of America (as): "Communications World" |
| 0130 | WHRI #2: "World of Radio" | 2125 | Radio Japan: "Media Roundup" |
| 0200 | Radio For Peace Int'l: "World of Radio" | 2235 | Radio Korea: "Shortwave Feedback" |
| 0245 | Radio Romania Int'l: "DX Mailbag" | 2245 | Radio Bulgaria: "Radio Bulgaria Calling" |
| 0259 | Vatican Radio: "Vatican On-the-Air" | 2253 | Vatican On-the-Air" |
| 0300 | WWCR #3: "Spectrum" | 2300 | Radio For Peace Int'l: "World of Radio" |
| 0324 | Deutsche Welle: "DXers World Meeting" | | |
| 0330 | Radio Havana Cuba: "DXers Unlimited" | | |
| 0410 | Radio Australia: "Feedback" | | |
| 0418 | Voice of Turkey: "DX Corner" | | |
| 0500 | WWCR #1: "World of Radio" | | |
| 0509 | HCJB: "DX Partyline" | | |
| 0523 | Radio Exterior de Espana: "Distance Unknown" | | |
| 0524 | Deutsche Welle: "DXers World Meeting" | | |
| 0525 | Radio Japan: "Media Roundup" | | |
| 0600 | KWHR (Hawaii): "World of Radio" | | |
| 0610 | Radio Australia: "Feedback" | | |
| 0630 | Radio Havana Cuba: "DXers Unlimited" | | |
| 0700 | WWCR #3: "World of Radio" | | |
| 0720 | Radio Japan: "Media Roundup" | | |
| 0810 | Radio Australia: "Feedback" | | |
| 0835 | Radio Koreia: "Shortwave Feedback" | | |
| 0940 | FEB (Philippines): "DX Report" | | |
| 1000 | Radio For Peace Int'l: "World of Radio" | | |
| 1120 | Radio Japan: "Media Roundup" | | |
| 1137 | Radio Koreia: "Shortwave Feedback" | | |
| 1235 | Radio Koreia: "Shortwave Feedback" | | |
| 1308 | Radio Koreia: "Shortwave Feedback" | | |
| 1354 | Vatican Radio: "Vatican On-the-Air" | | |
| 1407 | Voice of Israel: "Calling All Listeners" | | |
| 1419 | Voice of Israel: "DX Corner" | | |
| 1425 | Radio Japan: "Media Roundup" | | |
| 1436 | Radio Koreia: "Shortwave Feedback" | | |

Mondays

| | | | |
|------|--|------|--|
| 0000 | WWCR #1: "World of Radio" | 0000 | WWCR #1: "World of Radio" |
| 0125 | Radio Japan: "Media Roundup" | 0125 | Radio Koreia: "Shortwave Feedback" |
| 0330 | KWHR (Hawaii): "World of Radio" | 0330 | Radio New Zealand Int'l: "Mailbox" |
| 0430 | Radio New Zealand Int'l: "Mailbox" | 0430 | Radio Bulgaria: "Radio Bulgaria Calling" |
| 0545 | Radio Bulgaria: "Radio Bulgaria Calling" | 0545 | Voice of Med. (Malta): "VOM DX Corner" |
| 0620 | Voice of Med. (Malta): "VOM DX Corner" | 0620 | Radio Koreia: "Shortwave Feedback" |
| 0640 | Radio Koreia: "Shortwave Feedback" | 0640 | Radio Vlaanderen Int'l: "Radio World" |
| 0720 | Voice of Med. (Malta): "VOM DX Corner" | 0720 | Radio Vlaanderen Int'l: "Radio World" |
| 0739 | Radio Vlaanderen Int'l: "Radio World" | 0739 | Radio Bulgaria: "Radio Bulgaria Calling" |
| 1009 | Radio Bulgaria: "Radio Bulgaria Calling" | 1009 | Radio Vlaanderen Int'l: "Radio World" |
| 1045 | Radio Bulgaria: "Radio Bulgaria Calling" | 1045 | Radio Vlaanderen Int'l: "Radio World" |
| 1315 | Radio Bulgaria: "Radio Bulgaria Calling" | 1315 | Radio For Peace Int'l: "World of Radio" |
| 1420 | Voice of Med. (Malta): "VOM DX Corner" | 1420 | Voice of Med. (Malta): "VOM DX Corner" |
| 1500 | Radio For Peace Int'l: "World of Radio" | 1500 | Voice of Med. (Malta): "VOM DX Corner" |
| 2010 | Voice of Israel: "Calling All Listeners" | 2010 | Voice of Israel: "Calling All Listeners" |
| 2241 | Voice of Israel: "Calling All Listeners" | 2241 | Voice of Israel: "DX Corner" |
| 2251 | Voice of Israel: "DX Corner" | 2251 | |

Tuesdays

| | | | |
|------|---|------|---|
| 1247 | Radio Sweden: "Media Scan" | 1247 | Radio Sweden: "Media Scan" |
| 1330 | WWCR #1: "World of Radio" | 1330 | WWCR #1: "World of Radio" |
| 1349 | Radio Romania Int'l: "For Radio Amateurs" | 1349 | Radio Romania Int'l: "For Radio Amateurs" |
| 1349 | Radio Sweden: "Media Scan" | 1349 | Radio Sweden: "Media Scan" |
| 1449 | Radio Sweden: "Media Scan" | 1449 | Radio Sweden: "Media Scan" |
| 1734 | Radio Sweden: "Media Scan" | 1734 | Radio Sweden: "Media Scan" |
| 1849 | Radio Sweden: "Media Scan" | 1849 | Radio Sweden: "Media Scan" |
| 1900 | Radio For Peace Int'l: "World of Radio" | 1900 | Radio For Peace Int'l: "World of Radio" |
| 2049 | Radio Sweden: "Media Scan" | 2049 | Radio Sweden: "Media Scan" |
| 2050 | Polish Radio: "Polish Radio DX Club" | 2050 | Polish Radio: "Polish Radio DX Club" |
| 2136 | Radio Havana Cuba: "DXers Unlimited" | 2136 | Radio Havana Cuba: "DXers Unlimited" |
| 2235 | Radio Havana Cuba: "DXers Unlimited" | 2235 | Radio Havana Cuba: "DXers Unlimited" |
| 2249 | Radio Sweden: "Media Scan" | 2249 | Radio Sweden: "Media Scan" |
| 2349 | Radio Sweden: "Media Scan" | 2349 | Radio Sweden: "Media Scan" |

Wednesdays

| | | | |
|------|--------------------------------------|------|--------------------------------------|
| 0035 | Radio Havana Cuba: "DXers Unlimited" | 0035 | Radio Havana Cuba: "DXers Unlimited" |
| 0049 | Radio Sweden: "Media Scan" | 0049 | Radio Sweden: "Media Scan" |
| 0149 | Radio Sweden: "Media Scan" | 0149 | RAE Argentina: "DX'ers Special" |
| 0220 | RAE Argentina: "DX'ers Special" | 0220 | WWCR #2: "World of Radio" |

Saturdays

| | | | |
|------|--|------|---|
| 0010 | Radio Australia: "Feedback" | 0235 | Radio Havana Cuba: "DXers Unlimited" |
| 0045 | Radio Bulgaria: "Radio Bulgaria Calling" | 0300 | Radio For Peace Int'l: "World of Radio" |
| 0435 | Radio Sweden: "Media Scan" | 0349 | Radio Sweden: "Media Scan" |
| 0535 | Radio Havana Cuba: "DXers Unlimited" | 0700 | HCJB: "The Latest Catch" |
| 0700 | HCJB: "The Latest Catch" | 0800 | HCJB: "Ham Radio Today" |
| 0930 | HCJB: "The Latest Catch" | 1030 | HCJB: "Ham Radio Today" |
| 1100 | Radio For Peace Int'l: "World of Radio" | 1100 | Radio For Peace Int'l: "World of Radio" |
| 1315 | FEB (Philippines): "DX Report" | 1315 | Radio Prague: "Calling All Listeners" |
| 1611 | Radio Prague: "Calling All Listeners" | 1730 | HCJB: "Ham Radio Today" |
| 1800 | HCJB: "The Latest Catch" | 1800 | HCJB: "The Latest Catch" |
| 1810 | Radio Prague: "Calling All Listeners" | 1820 | Polish Radio: "Polish Radio DX Club" |
| 1920 | RAE Argentina: "DX'ers Special" | 1920 | RAE Argentina: "DX'ers Special" |
| 2110 | Radio Prague: "Calling All Listeners" | 2110 | Radio Prague: "Calling All Listeners" |

Thursdays

| | | | |
|------|--|------|--|
| 0900 | | 0900 | |
| 0940 | | 0940 | |
| 1009 | | 1009 | |
| 1010 | | 1010 | |
| 1030 | | 1030 | |
| 1200 | | 1200 | |
| 1210 | | 1210 | |
| 1220 | | 1220 | |
| 1344 | | 1344 | |
| 1345 | | 1345 | |
| 1345 | | 1345 | |
| 1352 | | 1352 | |
| 1515 | | 1515 | |
| 1610 | | 1610 | |
| 1709 | | 1709 | |
| 1800 | | 1800 | |
| 1909 | | 1909 | |
| 2145 | | 2145 | |
| 2205 | | 2205 | |
| 2240 | | 2240 | |
| 2255 | | 2255 | |
| 2315 | | 2315 | |
| 2345 | | 2345 | |

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko B.W. Battin
California New Mexico

Next Reporting Deadline

Jim Frimmel, Program Manager
Texas

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

"Newslines" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

| | | | | |
|-----------------------------------|------------------------------------|----------------------------|------------------------------------|------------------------------------|
| 0000 UTC | R Slovakia Int'l [S/T-F] | 0230 | 0355 | Radio Cameroon |
| (8:00 PM EDT, 5:00 PM PDT) | Radio Australia | Radio Havana Cuba [T-A] | Radio Japan | Radio Havana Cuba [T-S] |
| BBC | Radio Havana Cuba [T-S] | Radio Moscow [T-A] | | Radio Japan |
| CBC Northern Quebec Service | Radio Japan | Radio Netherlands Int'l | | Radio Moscow |
| [S] | Radio Korea | Radio Pakistan | 0400 UTC | Radio New Zealand Int'l [S-F] |
| China Radio Int'l | Radio Moscow | Radio Portugal Int'l [T-A] | (12:00 AM EDT, 9:00 PM PDT) | Radio Norway Int'l [M] |
| Monitor Radio Int'l [T-A] | Radio New Zealand Int'l [M-A] | Radio Sweden [T-A] | BBC | Spanish National Radio |
| Radio Australia | Radio Prague | Radio Tirana | BBC (af) | Swiss Radio Int'l (eu) |
| Radio Bulgaria | Radio Tashkent | | CBC Northern Quebec Service | Vatican Radio [T/F] |
| Radio Canada Int'l [S-M] | Radio Ukraine Int'l | | Channel Africa | Voice of America (af/me) |
| Radio Havana Cuba [T-S] | Radio Yugoslavia [M-A] | | China Radio Int'l | Voice of Israel |
| Radio Moscow | Spanish National Radio | | Deutsche Welle | WINB [M-A] |
| Radio New Zealand Int'l [M-A] | Swiss Radio Int'l | | Monitor Radio Int'l [T-F] | WYFR (Satellite Network) [T-A] |
| Radio Norway Int'l [S] | Voice of America (am/as/ca) | | Radio Australia | 0510 |
| Radio Prague | Voice of Indonesia | | Radio Canada Int'l | Radio Australia [M-F]* |
| Radio Thailand | 0110 | | Radio Havana Cuba [T-S] | Radio Havana Cuba [T-S]* |
| Spanish National Radio | Radio Australia [M-F]* | | Radio Moscow | 0530 |
| Voice of America (am/as/ca) | Radio Havana Cuba [S/T-F]* | | Radio New Zealand Int'l [A] | Channel Africa [S-F] |
| WWCR #3 [S] | Radio Japan [A]* | | Radio New Zealand Int'l [M-F] | Radio Austria Int'l |
| 0003 | 0130 | | Radio Romania Int'l | Radio Dubai |
| Radio Pyongyang | BBC (as) [T-A]* | | Radio Tanzania | Radio Finland |
| 0009 | Radio Austria Int'l | | Radio Ukraine Int'l | Radio Havana Cuba [T-A] |
| BBC* | Radio Havana Cuba [T-A] | | Swiss Radio Int'l | Radio Moscow |
| China Radio Int'l* | Radio Moscow | | Voice of America (af/me) | Radio Romania Int'l |
| 0010 | Radio Netherlands Int'l | | Voice of Turkey | Radio Yugoslavia |
| Radio Havana Cuba [T-S]* | Radio Sweden [T-A] | | WHRI #2 [T-H/A] | Voice of Nigeria |
| Voice of America (ca) [T-A]* | Radio Tirana | | WINB [M-A] | 0555 |
| 0015 | Voice of Greece | | WWCR #1 [S] | Radio Japan [A] |
| Radio Cairo | 0145 | | WWCR #3 [T-A] | |
| 0030 | BBC (ca) [T-A]* | | 0403 | 0600 UTC |
| Radio Havana Cuba [T-A] | 0155 | | Radio Pyongyang | (2:00 AM EDT, 11:00 PM PDT) |
| Radio Moscow | Voice of Indonesia | | 0409 | BBC |
| Radio Nacional de Venezuela | | | China Radio Int'l* | BBC (af) [A-S]* |
| [T-S] | 0200 UTC | | 0410 | BBC (af) [M-F] |
| Radio Netherlands Int'l | (10:00 PM EDT, 7:00 PM PDT) | | Radio Havana Cuba [T-S]* | CBC Northern Quebec Service |
| Radio New Zealand Int'l [M-F] | BBC | | 0411 | Channel Africa [T] |
| Radio Sweden [T-A] | CBC Northern Quebec Service | | Channel Africa | Deutsche Welle |
| Radio Thailand | [S] | | 0425 | Monitor Radio Int'l [T-F] |
| Radio Vlaanderen Int'l | Christian Science Sentinel [A] | | RAI Italy | Radio Australia |
| Voice of America (am) [T-S] | Deutsche Welle | | 0430 | Radio Canada Int'l [M-F] |
| (Special English) | Monitor Radio Int'l [T-F] | | Radio Havana Cuba | Radio Havana Cuba |
| Voice of America (as) (Special | Radio Australia | | 0431 | Radio Japan |
| English) | Radio Budapest Int'l | | Channel Africa [T/H/F] | Radio Korea |
| Voice of America (ca) [S] | Radio Canada Int'l | | Voice of America (af) [M-F]* | Radio Moscow |
| (Special English) | Radio Havana Cuba [T-S] | | 0440 | Radio New Zealand Int'l |
| 0050 | Radio Moscow | | BBC (af) [A-M]* | Radio Yemen |
| RAI Italy | Radio New Zealand Int'l [M-A] | | 0445 | Swiss Radio Int'l |
| 0055 | Radio Norway Int'l [M] | | BBC (af) [T-F]* | Swiss Radio Int'l (eu) |
| Vatican Radio [S-W-F] | Radio Romania Int'l | | Radio Yerevan | Voice of America (af) [A-S] |
| | Voice of America (am) [T-A] | | 0500 UTC | Voice of America (me) |
| 0100 UTC | Voice of America (as) | | (1:00 AM EDT, 10:00 PM PDT) | Voice of Kenya |
| (9:00 PM EDT, 6:00 PM PDT) | Voice of Myanmar (Burma) | | BBC ("Newshour") | Voice of Malaysia |
| All India Radio | WINB [T-A] | | CBC Northern Quebec Service | WINB [T-A] |
| BBC | 0203 | | 0601 | Voice of America (af) [M-F]* |
| CBC Northern Quebec Service | Voice of Free China | | 0603 | Radio Pyongyang |
| Deutsche Welle | 0210 | | 0609 | BBC* |
| FEBG (Philippines) | Radio Havana Cuba [T-S]* | | | |
| HCJB | 0215 | | | |
| Monitor Radio Int'l [T-A] | Radio Cairo | | | |
| R Slovakia Int'l [A]* | Radio Nepal | | | |

SHORTWAVE GUIDE

| | | | |
|------------------------------------|-----------------------------------|-----------------------------------|------------------------------------|
| 0610 | Radio New Zealand Int'l [M-F]* | Radio Australia | Radio Moscow |
| 0627 | Radio Havana Cuba [S/T-F]* | Radio Ghana [A-S] | Radio Vlaanderen Int'l [M-A] |
| BBC (af) [M-F]* | R Slovakia Int'l | Radio Japan | Voice of America (as) |
| 0630 | Radio Austria Int'l [T-S] | Radio Jordan | Voice of Israel [S-H] |
| Radio Austria Int'l [T-S] | Radio Austria Int'l [T-S] | Radio Moscow | WWCR #1 [M-F] |
| Radio Havana Cuba [T-A] | Radio Moscow [M-A] | Radio Mozambique | WYFR (Satellite Network) [M-F] |
| Radio Japan [A]* | Radio Netherlands Int'l | Radio New Zealand Int'l | 1409 |
| Radio Moscow | Voice of Indonesia [A-H] | Radio Pakistan | China Radio Int'l* |
| Radio Yemen | | Radio Singapore Int'l | 1410 |
| Vatican Radio [H] | | Swiss Radio Int'l | Radio Japan [M-F]* |
| Voice of Nigeria [M-F] | | Swiss Radio Int'l (eu) | 1415 |
| 0631 | 0900 UTC | Vatican Radio [M-A] | Radio Nepal |
| 0632 | (5:00 AM EDT, 2:00 AM PDT) | Voice of America (as/ca) | 1424 |
| Radio Romania Int'l | BBC | Voice of Israel | HCJB [M-F] |
| 0640 | China Radio Int'l | WWCR #1 [M-F] | 1430 |
| Vatican Radio [T] | Christian Science Sentinel [T/F] | WYFR (Satellite Network) [M-A] | FEBC (Philippines) |
| 0645 | Deutsche Welle | 1103 | Radio Canada Int'l |
| Radio Romania Int'l | Monitor Radio Int'l [T-F] | Radio Pyongyang | Radio Ghana |
| Voice of Nigeria [M-F]* | Papua New Guinea [M]* | 1110 | Radio Korea |
| 0655 | Radio Australia | Radio Australia* | Radio Moscow |
| Voice of Med. (Malta) [M-F] | Radio Finland | 1130 | Radio Norway Int'l [S] |
| 0700 UTC | Radio Japan | Radio Japan [A]* | Radio Romania Int'l [M-A] |
| (3:00 AM EDT, 12:00 AM PDT) | Radio Moscow | Radio Korea | Radio Singapore Int'l |
| BBC | Radio New Zealand Int'l [M-F] | Radio Moscow | Radio Tanzania [A-S] |
| Monitor Radio Int'l [T-F] | Swiss Radio Int'l | Radio Nacional de Venezuela | Radio Tashkent [S] |
| Papua New Guinea | 0909 | [M-A] | Swiss Radio Int'l |
| Radio Australia | China Radio Int'l* | Radio Pyongyang | Voice of America (as) |
| Radio Japan | 0930 | Radio Netherlands Int'l | Voice of Kenya |
| Radio Moscow | FEBC (Philippines) | Radio Prague | WYFR (Satellite Network) [M-F] |
| Radio New Zealand Int'l [M-F]* | Radio Japan [A]* | Radio Singapore Int'l | 1301 |
| Radio Prague | Radio Moscow | Voice of Asia | Radio Romania Int'l [S] |
| Vatican Radio [M-A] | Radio Netherlands Int'l | 1303 | 1303 |
| Voice of Myanmar (Burma) | Radio Yerevan [S] | WYFR (Satellite Network) [M-F] | Radio Pyongyang |
| WWCR #1 [S-H] | 0940 | 1145 | 1309 |
| 0703 | Voice of Greece | Deutsche Welle [M-F]* | China Radio Int'l* |
| Radio Pyongyang | 0945 | 1200 UTC | 1310 |
| Voice of Free China | Deutsche Welle [M-F]* | (8:00 AM EDT, 5:00 AM PDT) | Radiobrçs [M-F] |
| 0705 | 0955 | BBC | 1324 |
| Radio New Zealand Int'l [M-F]* | Radio Japan | CBC Northern Quebec Service | HCJB [M-F] |
| 0710 | 1000 UTC | [A-S] | 1328 |
| Radio Australia [M-F]* | (6:00 AM EDT, 3:00 AM PDT) | China Radio Int'l | Radio Cairo |
| 0730 | China Radio Int'l | Christian Science Sentinel [A] | 1330 |
| BBC (af) [A]* | Christian Science Sentinel [A-S] | Monitor Radio Int'l [M-F] | All India Radio |
| HCJB | FEBC (Philippines) [M-F]* | Papua New Guinea | 1445 |
| Radio Japan [A]* | HCJB | Radio Australia | FEBC (Philippines) [S-F]* |
| Radio Moscow | Monitor Radio Int'l [M-F] | Radio France Int'l | BBC (as) [M-F] (Special English) |
| Radio Netherlands Int'l | Papua New Guinea | Radio Moscow | Voice of Myanmar (Burma) |
| Radio Pakistan | Radio Australia | Radio Finland [M-A] | 1450 |
| Radio Prague | Radio Bulgaria | Radio Moscow [M-A] | All India Radio |
| Radio Vlaanderen Int'l | Radio Moscow | Radio Netherlands Int'l | 1455 |
| 0731 | Radio New Zealand Int'l | Radio Singapore Int'l | All India Radio |
| 0745 | Radio Tanzania | Radio Tashkent | Radio Japan [A] |
| Radio Finland | Radio Vlaanderen Int'l [M-A] | Voice of America (as) | Voice of Med. (Malta) [M-F] |
| 0750 | Swiss Radio Int'l (eu) | WYFR (Satellite Network) [M-A] | 1500 UTC |
| [A] | Voice of America (as/ca) | 1203 | (11:00 AM EDT, 8:00 AM PDT) |
| Radio New Zealand Int'l [M-F]* | Voice of Kenya | Radio Korea | BBC |
| 0755 | China Radio Int'l* | Voice of Free China | BBC (af) [M-F] |
| Radio Japan | 1009 | 1204 | CBC Northern Quebec Service |
| Voice of Med. (Malta) [M-F] | Radio New Zealand Int'l [M-F]* | HCJB [M-F] | [A-S] |
| 0800 UTC | Radio Austria Int'l [M-A] | 1209 | Channel Africa |
| (4:00 AM EDT, 1:00 AM PDT) | Radio Dubai | BBC [W]* | China Radio Int'l |
| BBC | Radio Moscow | China Radio Int'l* | Christian Science Sentinel [A] |
| Christian Science Sentinel [T/F] | Radio Netherlands Int'l | 1230 | Deutsche Welle |
| KNLS | Voice of Nigeria | HCJB [M-F]* | Monitor Radio Int'l [M-F] |
| Monitor Radio Int'l [T-F] | 1045 | Radio Austria Int'l | Radio Australia |
| Radio Australia | Radio New Zealand Int'l [M-F]* | Radio Bangladesh [S-M] | Radio Canada Int'l [S] |
| Radio Korea | Voice of Nigeria [A-S]* | Radio Bulgaria | Radio Japan |
| Radio Moscow | 1100 UTC | Radio Cairo | Radio Jordan |
| Radio New Zealand Int'l | (7:00 AM EDT, 4:00 AM PDT) | Radio Canada Int'l | Radio Moscow |
| Radio Pakistan | BBC | Radio Finland [M-A] | Radio Omdurman |
| Voice of Indonesia [A-H] | Channel Africa | Radio Moscow | Swiss Radio Int'l |
| Voice of Malaysia | Christian Science Sentinel [A] | Radio Netherlands Int'l | Voice of America (as/me) |
| 0803 | Deutsche Welle | Radio Singapore Int'l | WWCR #1 [M-F] |
| Radio Pyongyang | Monitor Radio Int'l [M-F] | Radio Sweden [M-F] | 1503 |
| | Papua New Guinea | Radio Switzerland Int'l | Radio Pyongyang |
| | | Radio Thailand Int'l | 1505 |
| | | Radio Vietnam Int'l | Radio Veritas [T-F] |
| | | WYFR (Satellite Network) [M-F] | 1525 |
| | | 1240 | Radio Algiers [M] |
| | | Voice of Greece | 1509 |
| | | 1258 | China Radio Int'l* |
| | | Africa No. 1 (Gabon) | 1510 |
| | | | Radio Japan [M-F]* |
| | | | 1525 |
| | | | BBC (af) [S]* |
| | | | Radio Veritas [T-F] |
| | | | 1530 |
| | | | All India Radio |
| | | | Deutsche Welle [M-F]* |
| | | | FEBC (Philippines) |

| | | | | |
|---|---|--------------------------------|---|--------------------------------|
| Radio Austria Int'l | Radio Japan | Radio New Zealand Int'l [F]* | WINB [M-F] | 2155 |
| Radio Japan [A]* | Radio Moscow | 1840 | WWCR #3 | Radio Canada Int'l [M-F] |
| Radio Moscow | Radio New Zealand Int'l [M-F]* | Voice of Greece [M-A] | 2003 | Radio Japan [A] |
| Radio Netherlands Int'l | Radio Pakistan | 1855 | Radio Pyongyang | 2200 UTC |
| Radio Portugal Int'l [M-F] | Radio Tirana | Radio New Zealand Int'l [M-H]* | 2007 | (6:00 PM EDT, 3:00 PM PDT) |
| Voice of Nigeria [M-H] | Swiss Radio Int'l | 1857 | Radio Damascus [M-F] | All India Radio |
| WYFR (Satellite Network) [M-F] | Voice of America (af/as/me) | BBC (af) [M-F]* | 2009 | BBC |
| 1540 | WRNO [M-F] | 1900 UTC | China Radio Int'l* | CBC Northern Quebec Service |
| Radio Veritas [A-M] | WYFR (Satellite Network) [M-A] | (3:00 PM EDT, 12:00 PM PDT) | 2010 | [A-S] |
| 1550 | 1703 | All India Radio [W] | Radio New Zealand Int'l [S-H]* | China Radio Int'l |
| Voice of Med. (Malta) [F] | Radio Pyongyang | BBC | 2025 | Christian Science Sentinel [A] |
| 1555 | 1709 | China Radio Int'l | RAI Italy | Monitor Radio Int'l [M-F] |
| Radio Japan [A] | China Radio Int'l* | Christian Science Sentinel [A] | 2030 | Radio Australia |
| Radio Veritas [A-M] | 1710 | Deutsche Welle | Radio Budapest Int'l | |
| Voice of Med. (Malta) [M-H] | Radio Australia* | Monitor Radio Int'l [M-F] | Radio Bulgaria | |
| 1600 UTC | 1715 | Radio Australia | Radio Canada Int'l | |
| (12:00 PM EDT, 9:00 AM PDT) | Radio Sweden [M-F] | Radio Bulgaria | Radio Havana Cuba [M-A] | |
| BBC | 1725 | Radio Japan | Radio Korea | |
| CBC Northern Quebec Service | Radio New Zealand Int'l [F]* | Radio Moscow [A-S] | Radio New Zealand Int'l | |
| [A-S] | 1730 | Radio Netherlands Int'l | Radio Prague | |
| Channel Africa | Radio Moscow [S-F] | Radio Portugal Int'l [M-F] | Radio Ukraine Int'l | |
| China Radio Int'l | Radio Netherlands Int'l | Radio Romania Int'l [T-S] | Radio Vlaanderen Int'l [M-F] | |
| Christian Science Sentinel [A] | Radio Romania Int'l | Radio Tirana | RAI Italy | |
| Deutsche Welle | Vatican Radio [F] | Radio Vlaanderen Int'l | Voice of America (as) | |
| Monitor Radio Int'l [M-F] | Voice of America (af) [S] | Spanish National Radio | WWCR #3 [S-F] | |
| Polish Radio [A] | 1740 | Swiss Radio Int'l (eu) | 2203 | |
| Polish Radio [M-F]* | BBC (af)* | Voice of America (af/as/me) | Voice of Free China | |
| Radio Australia | 1745 | WHRI #1 [M-F] | 2209 | |
| Radio Canada Int'l [S] | All India Radio | WINB [M-F] | China Radio Int'l* | |
| Radio France Int'l | Radio Canada Int'l [M-F] | WWCR #1 [M-F] | 2215 | |
| Radio Jordan | 1755 | WWCR #3 [S-F] | All India Radio [M/W/F] | |
| Radio Korea | Radio Japan [A] | 1901 | Radio Cairo | |
| Radio Moscow | Radio New Zealand Int'l [M-H]* | Radio Romania Int'l [M] | 2230 | |
| Radio Pakistan | 1800 UTC | 1909 | Radio Havana Cuba [M-F]* | |
| Radio Prague | (2:00 PM EDT, 11:00 AM PDT) | China Radio Int'l* | Radio Moscow [M-F] | |
| Radio Tallinn [M-F] | All India Radio | 1910 | Radio Sweden [M-F] | |
| Radio Tanzania | BBC | All India Radio [W] | Radio Yerevan | |
| Voice of America (af) [A-S] | CBC Northern Quebec Service | Radio Australia [M-F]* | Voice of America (as) (Special English) | |
| Voice of America (as/me) | [A] | 1930 | Voice of Israel | |
| Voice of Ethiopia | Christian Science Sentinel [A] | BBC (af) [S]* | 2240 | |
| Voice of Kenya | Monitor Radio Int'l [M-F] | Deutsche Welle [T-F]* | Radio Cairo | |
| Voice of Nigeria [M-F] | Polish Radio [A] | R Slovakia Int'l | Voice of Greece [S-F] | |
| WRNO [W] | Polish Radio [M-F]* | Radio Austria Int'l | 2300 UTC | |
| WYFR (Satellite Network) [A] | Radio Australia | Radio Japan [A]* | (7:00 PM EDT, 4:00 PM PDT) | |
| 1604 | Radio Cameroon | Radio Moscow | BBC | |
| [M-F] | Radio Moscow | Radio Netherlands Int'l | Christian Science Sentinel [A] | |
| 1609 | Radio Mozambique | 1933 | Monitor Radio Int'l [M-F] | |
| BBC* | Radio New Zealand Int'l [M-F]* | Deutsche Welle [M]* | Radio Australia | |
| China Radio Int'l* | Radio Norway Int'l [S] | 1935 | Radio Canada Int'l | |
| 1611 | Radio Omdurman | RAI Italy | Radio Damascus [F] | |
| Radio France Int'l [T]* | Radio Prague | 1955 | Radio Havana Cuba [M-A] | |
| 1612 | Radio Tanzania | Radio Japan [T-W/S] | Radio Japan | |
| Vatican Radio [S-F] | Radio Yemen | 2000 UTC | Radio Moscow | |
| 1630 | Voice of America (af) [A-S] | (4:00 PM EDT, 1:00 PM PDT) | Radio New Zealand Int'l [A-H] | |
| [M-F]* | Voice of America (af) [M-F]* | BBC | Radio Prague | |
| Radio Canada Int'l | Voice of America (me) | Radio Netherlands Int'l | Radio Romania Int'l | |
| Radio Dubai | Voice of Kenya | 1933 | Radio Yugoslavia | |
| Radio Moscow | WHRI #1 [M-F] | Deutsche Welle [M]* | Spanish National Radio | |
| Voice of America (af) [M-F]* | WINB [M-F] | 1935 | Voice of America (af/as/me) | |
| Voice of America (as/me) | WWCR #3 [S-F] | RAI Italy | Voice of Greece [M-A] | |
| (Special English) | 1805 | 1955 | Voice of Turkey | |
| Voice of America (me) (Special English) | Radio New Zealand Int'l [M-F]* | Radio Japan [T-W/S] | WINB [M-F] | |
| Voice of Ethiopia | 1815 | 2000 UTC | WWCR #3 [S-F] | |
| 1645 | Radio Bangladesh | (4:00 PM EDT, 1:00 PM PDT) | 2109 | |
| BBC (as)* | 1830 | BBC | China Radio Int'l* | |
| 1700 UTC | Radio Kuwait | China Radio Int'l | 2110 | |
| (1:00 PM EDT, 10:00 AM PDT) | Radio Moscow | Christian Science Sentinel [A] | Radio Damascus [S-M] | |
| BBC | Radio Nacional de Venezuela | Deutsche Welle | Radio New Zealand Int'l [S-H]* | |
| BBC (af) | [M-A] | KVOH [A-S] | 2112 | |
| CBC Northern Quebec Service | Radio Netherlands Int'l | Monitor Radio Int'l [M-F] | Radio Damascus [F] | |
| [A] | Radio Sweden [M-F] | Radio Australia | 2115 | |
| Channel Africa | Radio Yemen | Radio Budapest Int'l | BBC (ca) [M-F]* | |
| China Radio Int'l | Voice of America (af) [A-S] | Radio Finland | Radio Damascus [T] | |
| Christian Science Sentinel [A] | (Special English) | Radio Moscow | 2120 | |
| HCJB | Voice of America (me) (Special English) | Radio New Zealand Int'l [S-F] | Radio Cairo | |
| Monitor Radio Int'l [M-F] | 1835 | Radio Norway Int'l [S] | Radio Canada Int'l [A] | |
| Radio Australia | Voice of Indonesia | Radio Tallinn [M/H] | 2130 | |
| | Voice of Israel | Radio Yugoslavia | Radio Austria Int'l | |
| | Voice of Nigeria [M-F] | Swiss Radio Int'l | Radio Cairo | |
| | WHRI #1 [M-F] | Vatican Radio [M-T] | Radio Canada Int'l [S] | |
| | 1835 | Voice of America (af) [A-S] | Radio Havana Cuba [W] | |
| | Voice of America (af) [M-F]* | Voice of America (af) [M-F] | Radio Havana Cuba [J]* | |
| | Voice of America (me) | Voice of America (me) | Radio Moscow | |
| | Voice of Indonesia | Voice of Israel | Radio Nacional de Venezuela [M-A] | |
| | Voice of Israel | Voice of Nigeria [M-F] | Radio Riga Int'l [M-F] | |
| | Voice of Nigeria [M-F] | WHRI #1 [M-F] | Radio Damascus [W] | |
| | WHRI #1 [M-F] | Radio Korea | Radio Korea | |

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FREQUENCIES

| | | | | | | | | | | |
|------------------|---------------------------|---------|---------|---------|---------|------------------|----------------------------|---------|---------|---------|
| 0000-0030 | Australia, Radio | 9610as | 13745as | 17750as | | 0000-0030 mtwhfa | Serbia, Radio Yugoslavia | 17570as | 17890as | 21625as |
| 0000-0100 vl | Australia, VL8A Alice Spg | 4835do | | | | 0000-0100 | Spain, R Exterior Espana | 9580na | 9620eu | 11870na |
| 0000-0100 vl | Australia, VL8K Katherine | 5025do | | | | 0000-0030 | Thailand, Radio | 9540na | | |
| 0000-0100 vl | Australia, VL8T Tent Crk | 4910do | | | | 0000-0100 | United Kingdom, BBC London | 9690af | | |
| 0000-0045 | Bulgaria, Radio | 9700na | 11720na | | | 0000-0100 | | 5965as | 5975na | 6175na |
| 0000-0015 | Cambodia, Natl Voice of | 11940as | | | | 0000-0100 | USA, KAI Dallas TX | 1750as | | 7325na |
| 0000-0100 vl | Canada, CBC N Quebec Sce | 9625do | | | | 0000-0100 | USA, KTBN Salt Lk City UT | 13740na | | |
| 0000-0100 | Canada, CFCX Montreal | 6005do | | | | 0000-0100 | USA, KVOH Los Angeles CA | 15595am | | |
| 0000-0100 | Canada, CFRX Toronto | 6070do | | | | 0000-0100 | USA, KWHR Naalehu HI | 9785am | | |
| 0000-0100 | Canada, CFVP Calgary | 6030do | | | | 0000-0100 | USA, Monitor Radio Intl | 17510as | | |
| 0000-0100 | Canada, CHNX Halifax | 6130do | | | | 0000-0030 | USA, R Bosnia H via WHRI | 7315am | | |
| 0000-0100 | Canada, CKZN St John's | 6160do | | | | 0000-0100 | USA, VOA Washington DC | 5995sa | 6130am | 7215as |
| 0000-0100 | Canada, CKZU Vancouver | 6160do | | | | 0000-0100 | | 9455am | 9770as | 7405sa |
| 0000-0100 | China, China Radio Intl | 9780na | 11715na | | | 0000-0100 | | 11695am | 11760as | 11580sa |
| 0000-0100 vl | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 0000-0100 | USA, WCSN Scotts Cor ME | 9852af | | |
| 0000-0100 | Cuba, Radio Havana Cuba | 6010na | 13700na | | | 0000-0100 | USA, WENV Birmingham AL | 7425na | 9410eu | 9985sa |
| 0000-0027 | Czech Rep, Radio Prague | 7345na | 9485na | | | 0000-0100 vl | USA, WHRI Noblesville IN | 7315am | | |
| 0000-0030 | Egypt, Radio Cairo | 9900na | | | | 0000-0100 | USA, WINB Red Lion PA | 11950am | | |
| 0000-0100 | Ghana, GBC Radio 1 | 4915do | | | | 0000-0100 | USA, WJCR Upton KY | 7490na | | 13595na |
| 0000-0100 | Ghana, GBC Radio 2 | 3366do | | | | 0000-0100 | USA, WRNO New Orleans LA | 7355am | | |
| 0000-0045 | India, All India Radio | 9705as | 11745as | 15110as | 15145as | 0030-0100 | USA, WWCR Nashville TN | 5810am | 7435am | 13845am |
| 0000-0100 vl | Italy, IRRS Milan | 7125eu | | | | 0030-0100 | Australia, Radio | 13605as | 13745as | 13755as |
| 0000-0100 | Lebanon, Wings of Hope | 9960me | | | | 0030-0100 | | 15415as | 17795pa | 15365pa |
| 0000-0100 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 0030-0100 | Belgium, R Vlaanderen Int | 6035na | 9930sa | |
| 0000-0100 vl | Malaysia, RTM Sarawak | 4950do | 7160do | | | 0030-0100 | Ecuador, HCJB Quito | 9745am | 12005am | 21455eu |
| 0000-0030 | Netherlands, Radio | 6020na | 6165na | | | 0030-0100 | Iran, VOIRI Tehran | 7100na | 9022na | |
| 0000-0100 | New Zealand, R NZ Intl | 15115pa | | | | 0030-0100 | Netherlands, Radio | 5905as | 6020na | 6165na |
| 0000-0050 | North Korea, R Pyongyang | 11335na | 13760na | 15130na | | 0030-0100 | | 9840na | | 7305as |
| 0000-0030 m | Norway, Radio Norway Intl | 6115sa | 6120na | | | 0030-0100 | Sri Lanka, SLBC Colombo | 6005as | 9720as | 15425as |
| 0000-0100 mtwhfa | Palau, KHBN Voice of Hope | 11980as | | | | 0030-0100 | Sweden, Radio | 6065sa | 9810sa | |
| 0000-0100 vl | Papua New Guinea, NBC | 9675do | | | | 0030-0100 | Thailand, Radio | 9655as | 11845af | 11905as |
| 0000-0100 | Philippines, FEBC Manila | 15450as | | | | 0030-0100 | Italy, RAI Rome | 9725na | 11800na | 15370na |
| 0000-0100 | Russia, Radio Moscow Intl | 5940na | 7295na | 9480na | 9530as | | | | | |
| | | 9750na | 11685na | 11750na | 11790na | | | | | |
| | | 12050na | 15410na | 15425na | 16190as | | | | | |

SELECTED PROGRAMS

Sundays

0010 Voice of America (am/ca): Agriculture Today. A weekly program about food, farming, and agricultural research.
 0010 Voice of America (as): VOA Sunday Morning. News closeups in a magazine format.
 0015 BBC: Good Books. Recommendation of a book to read.
 0030 BBC: The John Dunn Show (6th,20th,27th). A melodic mix of songs old and new.
 0030 BBC: Play of the Week. Redevelopment (13th). A rebroadcast of a 1989 play by Vaclav Havel, The Czech Republic's reigning president.
 0030 HCJB (am): Musical Mailbag. HCJB staffers have a good time reading listener letters and playing music.
 0040 Voice of America (am/as): Words and Their Stories (Special English). The origin and use of common words and phrases in American English.
 0045 Voice of America (am/as/ca): People in America (Special English). A program designed for those learning to speak English.

Mondays

0010 Voice of America (am/ca): Encounter. See S 1210.
 0010 Voice of America (as): VOA Business Report. News from around the world affecting business and finance.
 0015 BBC: Music Feature. Top Scores (7th). See S 0445.
 0015 BBC: Feature. It's Your Business (14th,21st,28th). See S 0445.
 0030 BBC: In Praise of God. Weekly programme of worship and meditation.
 0030 HCJB (am): Mountain Meditations. See S 1330.
 0030 Voice of America (am/ca): Spotlight. Extensive reports and interviews on people, places, and events of interest to listeners in the Caribbean and Latin America.
 0040 Voice of America (as): Development Report (Special English). Helpful information for developing nations.
 0045 Voice of America (as): This is America (Special English). Informative reports on life in the United States.

Tuesdays

0010 Voice of America (am/as): VOA Business Report. See M 0010.
 0015 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
 0030 HCJB (am): Focus on the Family. See M 1330.
 0030 Voice of America (ca): Music USA (Standards). See M 1130.

0040 Voice of America (am/as): Development Report (Special English). See M 0040.
 0045 Voice of America (am/as): This is America (Special English). See M 0045.

Wednesdays

0010 Voice of America (am/as): VOA Business Report. See M 0010.
 0015 BBC: Concert Hall. See S 1515.
 0030 HCJB (am): Focus on the Family. See M 1330.
 0030 Voice of America (ca): Now Music USA. See T 1130.
 0040 Voice of America (am/as): Science Report (Special English). Developments in the world of science and technology.
 0045 Voice of America (am/as): Space and Man (Special English). Reports about outer space or about the human body.

Thursdays

0010 Voice of America (am/as): VOA Business Report. See M 0010.
 0015 BBC: The Greenfield Collection. This classical music program replaces Ray on Record.
 0030 HCJB (am): Focus on the Family. See M 1330.
 0030 Voice of America (ca): Now Music USA. See T 1130.
 0040 Voice of America (am/as): Science Report (Special English). See W 0040.
 0045 Voice of America (am/as): The Making of a Nation (Special English). Chapters from U.S. history in special English.

Fridays

0010 Voice of America (am/as): VOA Business Report. See M 0010.
 0015 BBC: Music Review. News and views from the world of music.
 0030 HCJB (am): Focus on the Family. See M 1330.
 0030 Voice of America (ca): Now Music USA. See T 1130.
 0040 Voice of America (am/as): In the News (Special English). Focus on a person, organization, or issue in news reports.
 0045 Voice of America (am/as): American Stories (Special English). Readings of short stories by American authors in slow English.

Saturdays

0010 Voice of America (am/as): Newsline. See M 0110.
 0015 BBC: Feature. Tip of the Tongue (5th,12th,19th). NEW. Keith Harvey looks at the state of the English language in the fields of popular psychology, politics and illness.

0015 BBC: Music Feature. Family Affair (26th). NEW. Spotlights the best-known families in pop music, starting with the Jacksons.
 0030 BBC: From the Weeklies. Review of the British weekly press.
 0030 HCJB (am): Focus on the Family. See M 1330.

0030 Voice of America (ca): Country Music USA. See F 1130.
 0040 Voice of America (am/as): Words and Their Stories (Special English). See S 0040.
 0045 BBC: The Learning World. See M 0615.
 0045 Voice of America (am/as): Tuning in the USA (Special English). See S 0045.

MUSIC ON WRNO

| | |
|--|---------------|
| JAZZ 30 (Dixieland) | 0030 Wed, |
| | 0430 Sat, |
| | 0130 Sun |
| La Voix de Louisiane (French; Cajun/Zydeco) | 0100 Mon/Wed, |
| | 2000 Sun |
| Music of Carl Klang | 0545 Sat |
| Music & the Word (Mormon Tabernacle Choir) | 2300 Sun |
| Reelin the Years (Rock) | Various |
| Rock Over London | Various |
| Special Live Concerts - such as the 10-hour Farm Aid II broadcast in Sept. | |

For program schedules or QSLs, send SASE or 2 IRCs to WRNO WORLDWIDE, P.O. Box 100, New Orleans, LA 70181 USA

8:00 PM EST
5:00 PM PST

SHORTWAVE GUIDE

0100 UTC

FREQUENCIES

| | | | | | | | | | | | |
|--------------|---------------------------|---------|---------|---------|---------|------------------|----------------------------|---------|---------|---------|---------|
| 0100-0200 | Australia, ADF Radio | 13525as | | | | | | 15425na | 16190na | 17570as | 17690na |
| 0100-0200 | Australia, Radio | 9580pa | 9660pa | 11715as | 11855as | 0100-0200 | Slovakia, AWR Europe | 21625as | | | |
| | | 13605as | 13755as | 15240pa | 15365pa | 0100-0130 | Slovakia, R Slovakia Intl | 9465as | | | |
| | | 15415as | 15510as | 17715as | 17750as | 0100-0200 | South Korea, R Korea Intl | 5930na | 7310na | 9810na | |
| 0100-0200 vl | Australia, VL8A Alice Spg | 4835do | | | | 0100-0200 | Spain, R Exterior Espana | 7550eu | 15575am | | |
| 0100-0200 vl | Australia, VL8K Katherine | 5025do | | | | 0100-0200 | Sri Lanka, SLBC Colombo | 6005as | 9720as | 15425as | |
| 0100-0200 vl | Australia, VL8T Tent Crk | 4910do | | | | 0100-0130 | Switzerland, Swiss R Intl | 5885am | 6135am | 9885am | 13635am |
| 0100-0200 vl | Canada, CBC N Quebec Sce | 9625do | | | | 0100-0200 | Ukraine, R Ukraine Intl | 7285na | 9860na | 11720na | 12030na |
| 0100-0200 | Canada, CFCX Montreal | 6005do | | | | 0100-0200 | United Kingdom, BBC London | 15180na | 15580na | | |
| 0100-0200 | Canada, CFRX Toronto | 6070do | | | | 0100-0200 | USA, KAIJ Dallas TX | 5965as | 5975na | 6175na | 7160as |
| 0100-0200 | Canada, CFVP Calgary | 6030do | | | | 0100-0200 | USA, KTBN Salt Lk City UT | 7325na | 9580as | 9590na | 9915sa |
| 0100-0200 | Canada, CHNX Halifax | 6130do | | | | 0100-0200 | USA, KVOH Los Angeles CA | 11750sa | 11955me | 15260sa | 15310as |
| 0100-0200 | Canada, CKZN St John's | 6160do | | | | 0100-0200 | USA, KWHR Naaehu HI | 15360as | 17790as | | |
| 0100-0200 | Canada, CKZU Vancouver | 6160do | | | | 0100-0200 | USA, Monitor Radio Intl | 13740na | | | |
| 0100-0200 | Canada, RCI Montreal | 6120na | 9535na | 9755na | 11845na | 0100-0200 | USA, Radio Miami Intl | 7510na | | | |
| 0100-0200 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 0100-0200 | USA, VOA Washington DC | 17775am | | | |
| 0100-0200 | Cuba, Radio Havana Cuba | 6010na | 13700na | | | 0100-0200 | USA, VOA Washington DC | 17510as | | | |
| 0100-0127 | Czech Rep, Radio Prague | 7345na | 9485na | | | 0100-0130 twhfas | USA, VOA Washington DC | 7535na | 9430am | | |
| 0100-0200 | Ecuador, HCJB Quito | 9745am | 12005am | 21455eu | | 0100-0200 | USA, VOA Washington DC | 9955am | | | |
| 0100-0150 | Germany, Deutsche Welle | 6040na | 6085na | 6120na | 6145na | 0100-0200 | USA, VOA Washington DC | 5995sa | 6130sa | 7205as | 7405sa |
| 0100-0200 m | Guatemala, Radio Cultural | 3300do | | | | 0100-0200 | USA, VOA Washington DC | 9445sa | 9740as | 9775sa | 11580sa |
| 0100-0200 | Indonesia, Voice of | 9675as | 11752as | | | 0100-0200 | USA, VOA Washington DC | 11705as | 15120sa | 15250as | 15340as |
| 0100-0130 | Iran, VOIRI Tehran | 7100na | 9022na | | | 0100-0200 | USA, VOA Washington DC | 17740as | | | |
| 0100-0200 vl | Italy, IRRS Milan | 7125eu | | | | 0100-0200 | USA, VOA Washington DC | 21550as | | | |
| 0100-0110 | Italy, RAI Rome | 9725na | 11800na | | | 0100-0200 | USA, WEWN Birmingham AL | 9855af | | | |
| 0100-0200 | Japan, NHK/Radio | 5960na | 9565as | 11840as | 11860as | 0100-0200 | USA, WHRI Noblesville IN | 7425na | 13710na | | |
| 0100-0130 | Laos, National Radio of | 11910as | 15195as | 17810as | 17845as | 0100-0200 | USA, WINB Red Lion PA | 7315am | | | |
| 0100-0130 | Netherlands, Radio | 7116as | | | | 0100-0200 | USA, WJCR Upton KY | 11950am | | | |
| 0100-0125 | Netherlands, Radio | 5905as | 7305as | | | 0100-0200 | USA, WRNO New Orleans LA | 7490na | 13595na | | |
| 0100-0200 | New Zealand, R NZ Intl | 6020na | 6165na | 9840na | 11655na | 0100-0200 | USA, WWCR Nashville TN | 7355am | | | |
| 0100-0200 vl | Papua New Guinea, NBC | 15115pa | | | | 0100-0200 | USA, WWFR Okeechobee FL | 5810am | 7435am | 13845am | |
| 0100-0130 | Philippines, FEBC Manila | 9675do | | | | 0100-0200 | Uzbekistan, R Tashkent | 6065na | 9505na | 15440na | |
| 0100-0200 | Russia, Radio Moscow Intl | 15450as | | | | 0100-0200 | Albania, R Tirana Intl | 7190eu | 7250eu | 9715eu | 9740eu |
| 0100-0130 | | 5940na | 7165na | 7180na | 7205na | 0100-0200 | Austria, R Austria Intl | 9655na | 9870sa | 13730sa | |
| 0100-0130 | | 7295na | 9530na | 9750me | 11665me | 0100-0200 | Greece, Voice of | 9420na | 9935na | 15650au | |
| 0100-0130 | | 11685na | 11750na | 12050na | 15410na | 0100-0200 | Netherlands, Radio | 9860as | 11655as | | |
| | | | | | | 0100-0200 | Sweden, Radio | 9695na | 11695as | | |
| | | | | | | 0100-0200 | Vatican State, Vatican R | 7335as | 9650as | 11935as | |

SELECTED PROGRAMS

Sundays

0101 BBC: Plays of the Week: The Widowing of Mrs. Holroyd (6th). A coal miner's wife has a secret admirer. Candide (20th). A classic play by Voltaire. Three Hotels (27th). An executive has the unpleasant task of getting rid of employees.
 0109 HCJB (am): DX Partyline. Rich McVicar and Karen Schmidt share 35 minutes of DXing updates.
 0110 Voice of America (am/ca): Communications World. A look at the people, technologies, economics, and politics involved in modern telecommunications.
 0110 Voice of America (as): VOA Sunday Morning. See S 0010.
 0130 HCJB (am): Science, Scripture and Salvation. Proving scientific principles with the Bible.
 0130 Voice of America (am): Press Conference USA. Reporters interview an interesting personality on a subject in the news.
 0130 Voice of America (ca): Press Conference USA. See S 0130.
 0145 HCJB (am): What in the World. Reflections on happenings in the news.

Mondays

0101 BBC: Features. Freedom's Crusader (7th). Recalling the extraordinary life of Voltaire, one of the first true liberals. Pop on the Line (14th, 21st, 28th). Music stars answer callers' questions. (Guests to be announced on Multitrack).
 0109 HCJB (am): Saludos Amigos. An international friendship program with listener contributions.
 0110 Voice of America (am/ca): New Horizons. See S 1110.
 0110 Voice of America (as): Newsline. News, correspondent reports, interviews, and opinion.
 0130 Voice of America (am/ca): Issues in the News. See S 1130.
 0130 Voice of America (as): VOA Monday Morning. See S 0010.
 0145 BBC: Music Feature. Wood, Guts and Brass. Michael Oliver continues to talk to the makers of musical instruments.
 0145 HCJB (am): Quest. A service of HCJB and the Far East Broadcasting Corporation.

Tuesdays

0100 HCJB (am): Studio 9. World news, features and interviews with Ralph Kurtenback and Curt Cole.
 0105 BBC: Outlook. See M 1405.

0110 HCJB (am): Features and Interviews. Twenty minutes of magazine programming on Studio 9.
 0110 Voice of America (am/ca): Report to the Americas. The latest news affecting the region, as well as a roundup of sports, financial news, and the weather forecast.
 0110 Voice of America (as): Newsline. See M 0110.

0130 BBC: Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
 0130 HCJB (am): You Should Know. Len Kinzel looks inside and beyond world headlines.
 0130 Voice of America (as): VOA Tuesday Morning. See S 0010.
 0145 BBC: Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.
 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Wednesdays

0100 HCJB (am): Studio 9. See T 0100.
 0105 BBC: Outlook. See M 1405.
 0110 HCJB (am): Features and Interviews. See T 0110.
 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
 0110 Voice of America (as): Newsline. See M 0110.
 0130 HCJB (am): Turkey: An Ethnic Mosaic (2nd, 9th, 16th). A look at the over 40 different ethnic groups that inhabit Turkey. Crisis in the Family (23rd, 30th). NEW. See how families cope with crises in this series of eight programs.
 0130 HCJB (am): El Mundo Futuro. The world of science and technology and a "Computer Corner" segment.
 0130 Voice of America (as): VOA Wednesday Morning. See S 0010.
 0145 BBC: Country Style. With David Allan.
 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Thursdays

0100 HCJB (am): Studio 9. See T 0100.
 0105 BBC: Outlook. See M 1405.
 0110 HCJB (am): Features and Interviews. See T 0110.
 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
 0110 Voice of America (as): Newsline. See M 0110.
 0130 BBC: Waveguide. Hear World Service better.
 0130 HCJB (am): Ham Radio Today. John Beck with features,

tips, news, and helps for radio amateurs.
 0130 Voice of America (as): VOA Thursday Morning. See S 0010.
 0140 BBC: Book Choice. Short book reviews every week.
 0145 BBC: The Farming World. Reports on new developments from around the world.
 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Fridays

0100 HCJB (am): Studio 9. See T 0100.
 0105 BBC: Outlook. See M 1405.
 0110 HCJB (am): Features and Interviews. See T 0110.
 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
 0110 Voice of America (as): Newsline. See M 0110.
 0130 BBC: On the Move. A weekly program about travel and transport with Malcolm Billings.
 0130 HCJB (am): What's Cooking in the Andes?. Peruse the foods, cooking, and culinary cultures of Latin America with Karen Schmidt.
 0130 Voice of America (as): VOA Friday Morning. See S 0010.
 0145 BBC: Global Concerns. Update on environmental issues.
 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Saturdays

0100 HCJB (am): Studio 9. See T 0100.
 0105 BBC: Outlook. See M 1405.
 0110 HCJB (am): Features and Interviews. See T 0110.
 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
 0110 Voice of America (as): VOA Saturday Morning. See S 0010.
 0130 BBC: Worldbrief. Roundup of the week's news headlines, plus everything from sport and finance to best-sellers and weather.
 0130 HCJB (am): Musica del Ecuador. Jorge Zambrano presents a unique mix of Ecuadorian music. (Highly rated in Passport 1994)
 0145 BBC: Jazz Now and Then. George Reid presents a mixture of jazz for all ages.
 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

0200 UTC

SHORTWAVE9:00 PM EST
6:00 PM PST**FREQUENCIES**

| | | | | | | | | | | | |
|------------------|---------------------------|--|------------------------------|-------------------------------|------------------------------|-----------------|--|---------------------------------------|---------------------------------------|---|-----------------------------|
| 0200-0300 | Australia, Radio | 9580pa 15365pa 17795pa | 9660pa 15415as 17860pa | 13605as 15510as 17750as | 15240pa | 0200-0300 | Sri Lanka, SLBC Colombo Taiwan, VO Free China | 6005as 5950na 11825as | 9720as 7130as 15345as | 15425as 9680na | 11740ca |
| 0200-0300 vl | Australia, VL8A Alice Spg | 4835do | | | | 0200-0300 | United Kingdom, BBC London | 5975na 7235me 9630af 15260sa | 6175na 7325na 9915am 15360as | 6195me 9410eu 11750sa 17790as | 7155me 9590na 11955me |
| 0200-0300 vl | Australia, VL8K Katherine | 5025do | | | | 0200-0230 | USA, KAIJ Dallas TX | 9815am | | | 13740am |
| 0200-0300 vl | Australia, VL8T Tent Crk | 4910do | | | | 0200-0300 | USA, KTBN Salt Lk City UT | 7510am | | | |
| 0200-0300 vl | Canada, CBC N Quebec Sce | 9525do | | | | 0200-0230 | USA, KVOH Los Angeles CA | 17775am | | | |
| 0200-0300 | Canada, CFCX Montreal | 6005do | | | | 0200-0300 | USA, KWHR Naalehu HI | 17510as | | | |
| 0200-0300 | Canada, CFRX Toronto | 6070do | | | | 0200-0300 | USA, Monitor Radio Intl | 5850na | | | |
| 0200-0300 | Canada, CFVP Calgary | 6030do | | | | 0200-0300 | USA, VOA Washington DC | 5995sa 6130sa 9740as 15120sa | 9430ca 7205as 7405sa 15205sa | 7205as 11580sa 11705as 15250as | 17790as |
| 0200-0300 | Canada, CHNX Halifax | 6130do | | | | 0200-0300 | USA, KAIJ Dallas TX | 9815am | | | 21550as |
| 0200-0300 | Canada, CKZN St John's | 6160do | | | | 0200-0300 | USA, KTBN Salt Lk City UT | 7510am | | | |
| 0200-0300 | Canada, CKZU Vancouver | 6160do | | | | 0200-0230 | USA, KVOH Los Angeles CA | 17775am | | | |
| 0200-0230 | Canada, RCI Montreal | 6120na 11940am | 9535am | 9755na | 11845na | 0200-0300 | USA, KWHR Naalehu HI | 17510as | | | |
| 0200-0300 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 0200-0300 | USA, Monitor Radio Intl | 5850na | | | |
| 0200-0300 | Cuba, Radio Havana Cuba | 6010na | 9820na | | | 0200-0300 | USA, VOA Washington DC | 5995sa 6130sa 9740as 15120sa | 9430ca 7205as 7405sa 15205sa | 7205as 11580sa 11705as 15250as | 17790as |
| 0200-0300 | Ecuador, HCJB Quito | 9745am | 12005am | 21455eu | | 0200-0300 | USA, VOA Washington DC | 5995sa 6130sa 9740as 15120sa | 9430ca 7205as 7405sa 15205sa | 7205as 11580sa 11705as 15250as | 17790as |
| 0200-0300 | Egypt, Radio Cairo | 9475na | | | | 0200-0300 | USA, WCRN Scotts Cor ME | 7465am | | | |
| 0200-0250 | Germany, Deutsche Welle | 6035as 9615as | 6130as 9690as | 7265as 9815as | 9515as | 0200-0300 | USA, WEWN Birmingham AL | 5825eu | | | |
| 0200-0230 | Hungary, Radio Budapest | 6025na | 9835na | 11910na | | 0200-0300 | USA, WHRI Noblesville IN | 7315am | | | |
| 0200-0300 vl | Italy, IRRS Milan | 7125eu | | | | 0200-0300 | USA, WINB Red Lion PA | 11950am | | | |
| 0200-0230 mtwfha | Kenya, Kenya BC Corp | 4935do | | | | 0200-0300 | USA, WJCR Upton KY | 7490na | | | |
| 0200-0300 smtwh | Malaysia, RTM Radio 4 | 7295do | | | | 0200-0300 | USA, WRNO New Orleans LA | 7355am | | | |
| 0200-0230 | Myanmar, Radio | 7185do | | | | 0200-0300 | USA, WWCR Nashville TN | 5810am | | | |
| 0200-0300 | Netherlands, Radio | 9860as | 11655as | | | 0200-0300 | USA, WYFR Okeechobee FL | 6085na | | | |
| 0200-0300 | New Zealand, R NZ Intl | 15115pa | | | | 0200-0300 | USA, WYFR Okeechobee FL | 6065na | | | |
| 0200-0230 m | Norway, Radio Norway Intl | 9560na | | | | 0215-0255 | Nepal, Radio | 5005do | | | |
| 0200-0300 vl | Papua New Guinea, NBC | 9675do | | | | 0230-0257 | Albania, R Tirana Intl | 9580na | | | |
| 0200-0300 | Romania, R Romania Intl | 6155na 11940na | 9510na | 9570na | 11830na | 0230-0300 s | Kenya, Kenya BC Corp | 4935do | | | |
| 0200-0300 | Russia, Radio Moscow Intl | 5940na 9620na 15410na 21625na | 7205af 9695af | 7295na 11665na | 9530na 12050as 17570as | 0230-0245 | Pakistan, Radio | 7290as | | | |
| | | | | | 17655au | 0230-0300 twfha | Portugal, Radio | 9550na | | | |
| | | | | | | 0230-0300 | Sweden, Radio | 9705na | | | |
| | | | | | | 0250-0300 | Vatican State, Vatican R | 6155na | | | |
| | | | | | | | | 9570na | | | |
| | | | | | | | | 11840na | | | |
| | | | | | | | | 6095na | | | |
| | | | | | | | | 9850na | | | |
| | | | | | | | | 7305na | | | |

SELECTED PROGRAMS**Sundays**

0200 HCJB (am): Sounds of Joy. Contemporary Christian music.
 0210 Voice of America (as): VOA Sunday Morning. See S 0010.
 0230 BBC: Features, Creeds, Councils and Controversies (6th). A four-part examinations of Turkey's religious past and present. The Struggle for Oil (13th, 20th, 27th). A series of five programs tells the story of oil from 1859.
 0230 HCJB (am): Solstice. A musical program from New Zealand for young people.

Mondays

0200 HCJB (am): Radio Reading Room. Readings from new Christian books.
 0210 Voice of America (as): Newsline. See M 0110.
 0230 BBC: Composer of the Month. Sir Edward Elgar is featured during November.
 0230 HCJB (am): The Headlines of the Week. Happenings in Ecuador and HCJB.
 0230 Voice of America (as): VOA Monday Morning. See S 0010.
 0235 HCJB (am): HCJB Today. HCJB missionaries share experiences, catch up on events, and play music.

Tuesdays

0200 HCJB (am): Master Control. A magazine program of current topics, lifestyle issues, and Christian themes.
 0210 Voice of America (am): Focus. See M 1110.
 0210 Voice of America (as): Newsline. See M 0110.
 0230 BBC: Quiz, Counterpoint. See M 1215.
 0230 HCJB (am): Sounds of Joy. See S 0200.
 0230 Voice of America (as): VOA Tuesday Morning. See S 0010.

Wednesdays

0200 HCJB (am): Unshackled. Pacific Garden Mission's radio drama.
 0210 Voice of America (am): Focus. See M 1110.
 0210 Voice of America (as): Newsline. See M 0110.
 0230 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.
 0230 HCJB (am): Blues, Rags, and All That Jazz. Bill Rapley selects some of the best in traditional jazz.
 0230 Voice of America (as): VOA Wednesday Morning. See S 0010.

Thursdays

0200 HCJB (am): The Latest Catch. Richard McVicar presents a

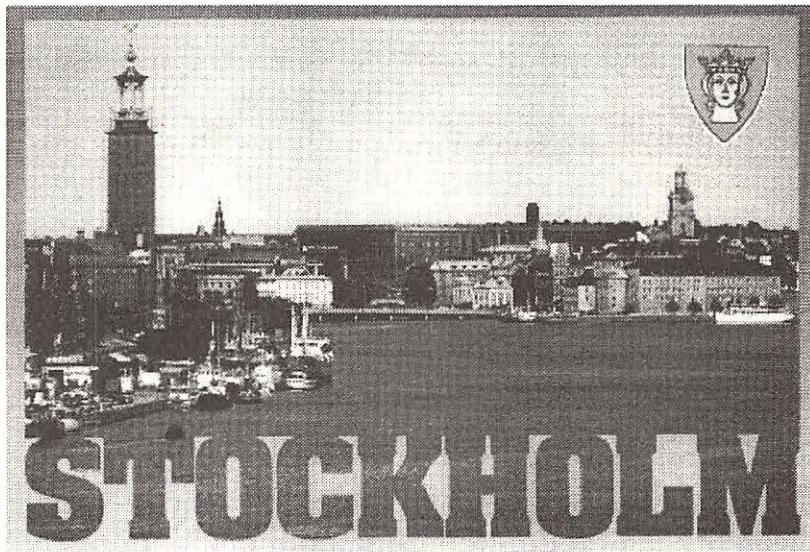
midweek update of the latest in shortwave listening.
 0210 Voice of America (am): Focus. See M 1110.
 0210 Voice of America (as): Newsline. See M 0110.
 0215 HCJB (am): The Book Nook. A new book-reading program hosted by Marita Regier.
 0230 BBC: Sports International. Live commentaries and interviews, features and discussions.
 0230 HCJB (am): Sounds of Joy. See S 0200.
 0230 Voice of America (as): VOA Thursday Morning. See S 0010.

0210 Voice of America (as): Newsline. See M 0110.
 0230 BBC: Thirty-Minute Drama. See H 1130.
 0230 HCJB (am): Woman to Woman. See H 0630.
 0230 Voice of America (as): VOA Friday Morning. See S 0010

Saturdays

0200 HCJB (am): On-Line. A magazine program of music, politics, arts, and science in Europe.
 0210 Voice of America (am): Focus. See M 1110.
 0210 Voice of America (as): VOA Saturday Morning. See S 0010.
 0230 BBC: People and Politics. Background to the British political scene.
 0230 HCJB (am): On Track. See F 0630.

0200 HCJB (am): Unshackled. See W 0200.
 0210 Voice of America (am): Focus. See M 1110.



Radio Sweden QSL courtesy of John Reves of New York.

10:00 PM EST
7:00 PM PST

SHORTWAVE

0300 UTC

FREQUENCIES

| | | | | | | | | | | | |
|-----------------|----------------------------|---------|---------|---------|---------|--------------|----------------------------|---------|---------|---------|---------|
| 0300-0400 twhfa | Argentina, RAE | 11710na | | | | | | | 17605as | 17675as | 17720as |
| 0300-0400 | Australia, Radio | 9580pa | 9660pa | 13605pa | 15240pa | 0300-0400 | S Africa, Channel Africa | 3220af | 5955af | | |
| | | 15365pa | 15415as | 15510as | 17795pa | 0300-0400 | Sri Lanka, SLBC Colombo | 9720as | 15425as | | |
| | | 17860pa | | | | 0300-0400 | Taiwan, VO Free China | 5950na | 9680na | 11745as | 11825au |
| 0300-0400 vl | Australia, VL8A Alice Spg | 4835do | | | | 0300-0400 | Thailand, Radio | 15345as | | | |
| 0300-0400 vl | Australia, VL8K Katherine | 5025do | | | | 0300-0400 vl | Uganda, Radio | 15370na | | | |
| 0300-0400 vl | Australia, VL8T Tent Crk | 4910do | | | | 0300-0330 | United Kingdom, BBC London | 4976do | | | |
| 0300-0400 | Bahrain, Radio | 6010do | | | | 0300-0400 | United Kingdom, BBC London | 6175na | 7235me | 7325na | 9915sa |
| 0300-0400 vl | Canada, CBC N Quebec Sce | 9625do | | | | 0300-0400 | United Kingdom, BBC London | 15360as | | | |
| 0300-0400 | Canada, CFCX Montreal | 6005do | | | | 0300-0400 | USA, KAIJ Dallas TX | 5975na | 6005af | 6175eu | |
| 0300-0400 | Canada, CFRX Toronto | 6070do | | | | 0300-0400 | USA, KTBN Salt Lk City UT | 6180eu | 6190af | 6195eu | 7230eu |
| 0300-0400 | Canada, CFVP Calgary | 6030do | | | | 0300-0400 | USA, KVOH Los Angeles CA | 7325eu | 9410eu | 11730af | 11760me |
| 0300-0400 | Canada, CHNX Halifax | 6130do | | | | 0300-0400 | USA, KWHR Naalehu HI | 11955as | 15280as | 15310me | 21715as |
| 0300-0400 | Canada, CKZN St John's | 6160do | | | | 0300-0400 | USA, Monitor Radio Intl | 9815am | | | |
| 0300-0400 | Canada, CKZU Vancouver | 6160do | | | | 0300-0400 | USA, VOA Washington DC | 7510am | | | |
| 0300-0400 | China, China Radio Intl | 9690na | 9780na | 11715na | | 0300-0400 | USA, WCSN Scotts Cor ME | 7425na | | | |
| 0300-0400 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 0300-0400 | USA, WEWN Birmingham AL | 7315am | | | |
| 0300-0400 vl | Costa Rica, Faro del Carib | 5055do | | | | 0300-0400 | USA, WHRI Noblesville IN | 11950eu | | | |
| 0300-0400 | Cuba, Radio Havana Cuba | 6010na | 9820na | | | 0300-0400 | USA, WINB Red Lion PA | 7490na | 13595na | | |
| 0300-0327 | Czech Rep, Radio Prague | 5930na | 7345na | | | 0300-0400 | USA, WRNO New Orleans LA | 7355am | | | |
| 0300-0400 | Ecuador, HCJB Quito | 9745am | 12005am | 21455eu | | 0300-0400 | USA, WWCR Nashville TN | 5810am | 5935am | 7435am | |
| 0300-0330 | Egypt, Radio Cairo | 9475na | | | | 0300-0400 | USA, WYFR Okeechobee FL | 6065na | 9505na | | |
| 0300-0350 | Germany, Deutsche Welle | 6045na | 6085na | 6120na | 9535na | 0300-0400 | USA, WYFR Okeechobee FL | 15440na | | | |
| 0300-0400 | Guatemala, Radio Cultural | 3300do | | | | 0300-0400 | Greece, Voice of | 9420na | 9935na | 15650au | |
| 0300-0400 vl | Italy, IRRS Milan | 7125eu | | | | 0300-0400 | Vatican State, Vatican R | 5865af | 7360af | 9725af | |
| 0300-0400 | Japan, NHK/Radio | 5960am | 9565as | 11875am | 15210am | 0300-0400 | Austria, R Austria Intl | 9870na | 13790sa | | |
| 0300-0330 | Japan, NHK/Radio | 15325am | 17810am | 17845am | | 0300-0345 | Czech Rep, Radio Prague | 5930eu | 9440eu | 11640af | |
| 0300-0400 | Kenya, Kenya BC Corp | 4935do | | | | 0315-0330 sh | Hungary, Radio Budapest | 5970na | 9835na | 11910na | |
| 0300-0400 s | Lebanon, Wings of Hope | 9960me | | | | 0320-0350 | Netherlands, Radio | 6015na | 6165na | | |
| 0300-0400 smtwh | Malaysia, RTM Radio 4 | 7295do | | | | 0330-0400 | Sweden, Radio | 6155na | 9850na | | |
| 0300-0325 | Netherlands, Radio | 9860as | 11655as | | | 0330-0400 | Tanzania, Radio | 5050af | | | |
| 0300-0400 | New Zealand, R NZ Intl | 15115pa | | | | 0330-0357 | UAE, Radio Dubai | 11945na | 13675na | 15400eu | 17890eu |
| 0300-0350 | North Korea, R Pyongyang | 6522eu | 9345eu | | | 0330-0357 | Greece, Voice of | 21485na | | | |
| 0300-0400 vl | Papua New Guinea, NBC | 9675do | | | | 0340-0350 | Tajikistan, Radio | 9420na | 9935na | 15650au | |
| 0300-0400 | Russia, Radio Moscow Intl | 5940na | 7205na | 7295na | 9530na | 0345-0400 | | 7245as | | | |
| | | 9620na | 9858na | 9750na | 9880as | | | | | | |
| | | 11665as | 11690as | 12030as | 12050as | | | | | | |
| | | 13615na | 15265as | 15375as | 15385as | | | | | | |
| | | 15410na | 15425na | 15535as | 16190as | | | | | | |

SELECTED PROGRAMS

Sundays

- 0300 HCJB (am): Sports Spectrum. News from the world of sports.
- 0310 Voice of America (af): VOA Sunday Morning. See S 0010.
- 0315 BBC: Sports Roundup. The latest sports news.
- 0330 BBC: From Our Own Correspondent. BBC correspondents comment on the background to the news.
- 0330 HCJB (am): Songtime Weekend. Evangelical teachings and music from Boston.
- 0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.

Mondays

- 0300 HCJB (am): The Sower. Michael Guido presents music and inspiration.
- 0300 Voice of America (af): Daybreak Africa. Magazine program of African news, sports, features, and correspondent reports.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): The Word Today. A discussion of Biblical themes.
- 0330 BBC: Anything Goes. See S 1430.
- 0330 HCJB (am): Sounds of Joy Worldwide. Dave Freeland hosts a program of Christian music.
- 0340 Voice of America (af): Development Report (Special English). See M 0040.
- 0345 Voice of America (af): This is America (Special English). See M 0045.

Tuesdays

- 0300 HCJB (am): Chords of Love. Music to encourage you.
- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): Rendezvous. Dick Saunders presents Bible study and evangelism.
- 0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0330 HCJB (am): Let My People Think. See S 1500.

- 0340 Voice of America (af): Agriculture Report (Special English). Developments and reports on farming and agriculture.
- 0345 Voice of America (af): Science in the News (Special English). Recent scientific developments.

Wednesdays

- 0300 HCJB (am): Psychology for Living. Christian advice on issues of today.
- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): Rendezvous. See T 0315.
- 0330 BBC: Discovery. In-depth look at scientific research.
- 0330 HCJB (am): Stories of Great Christians. Radio drama with Christian theme from the Moody Bible Institute.
- 0340 Voice of America (af): Science Report (Special English). See W 0040.
- 0345 HCJB (am): Wonderful Words of Life. Messages from the Salvation Army.
- 0345 Voice of America (af): Space and Man (Special English). See W 0045.

Thursdays

- 0300 HCJB (am): CBS Presents. Christian activities in the Caribbean.
- 0300 Voice of America (af): Daybreak Africa. See M 0300.

- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): Rendezvous. See T 0315.
- 0330 BBC: Assignment. A weekly examination of a topical issue.
- 0330 HCJB (am): The Living Word. See T 1100.

Fridays

- 0300 HCJB (am): Connecting Points. No information available.
- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): Rendezvous. See T 0315.
- 0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
- 0330 HCJB (am): Christian Brotherhood Hour. See H 1100.
- 0340 Voice of America (af): Environment Report. See F 1110.
- 0345 Voice of America (af): American Mosaic (Special English). See F 1115.

Saturdays

- 0300 HCJB (am): Science, Scripture and Salvation. See S 0130.
- 0310 Voice of America (af): VOA Saturday Morning. See S 0010.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 HCJB (am): Rendezvous. See T 0315.
- 0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
- 0330 HCJB (am): Adventures in Odyssey. Lively children's dramas from the "Focus on the Family" team.

THANK YOU . . .

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

Gerald R. Brookman, Kenai, AK; Jeff Camden, Tulsa, OK; Bob Fraser, Cohasset, MA; Clyde W. Harmon, Anniston, AL; Kevin Hecht, Devon, PA; Rev. Michael G. Mayer, Dover, DE; Jim Moats, Ravenna, OH; NASWA Journal; BBC Summary of World Broadcasts; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

FREQUENCIES

| | | | | | | | | | |
|-----------------|---------------------------|------------------------------|------------------------------|--------------------|---------|------------------|----------------------------|---------|-------------------------|
| 0400-0500 | Australia, Radio | 9580pa 15365pa 17860pa | 9660pa 15415pa 17750as | 13605as 17795pa | 15240pa | 0400-0500 | S Africa, Channel Africa | 3220af | 5955af |
| 0400-0500 vl | Australia, VL8A Alice Spg | 4835do | | | | 0400-0500 | Slovakia, AWR Europe | 9455as | 11610as |
| 0400-0500 vl | Australia, VL8K Katherine | 5025do | | | | 0400-0430 | Sri Lanka, SLBC Colombo | 9720as | 15425as |
| 0400-0500 vl | Australia, VL8T Tent Crk | 4910do | | | | 0400-0500 | Swaziland, Swazi Radio | 6155at | |
| 0400-0500 | Bahrain, Radio | 6010do | | | | 0400-0430 | Tanzania, Radio | 5050af | |
| 0400-0500 vl | Canada, CBC N Quebec Sce | 9625do | | | | 0400-0500 | Turkey, Voice of | 9445na | |
| 0400-0500 | Canada, CFCX Montreal | 6005do | | | | 0400-0500 vl | Uganda, Radio | 4976do | |
| 0400-0500 | Canada, CFRX Toronto | 6070do | | | | 0400-0500 | Ukraine, R Ukraine Intl | 9685na | 9860na 11720na 12030na |
| 0400-0500 | Canada, CFVP Calgary | 6030do | | | | 0400-0500 | United Kingdom, BBC London | 15180na | 15580na |
| 0400-0500 | Canada, CHNX Halifax | 6130do | | | | 0400-0500 | | 6190af | 6195eu 9410af 11760me |
| 0400-0500 | Canada, CKZN St John's | 6160do | | | | 0400-0500 | | 12095eu | 15280as 15310as 15575as |
| 0400-0500 | Canada, CKZU Vancouver | 6160do | | | | 0400-0430 | | 21715as | |
| 0400-0430 | Canada, RCI Montreal | 9650me | 11905me | 11925me | 15275me | 0400-0500 | USA, KAIJ Dallas TX | 9815am | |
| 0400-0500 | China, China Radio Intl | 11680na | 11840na | | | 0400-0500 | USA, KTBN Salt Lk City UT | 7510am | |
| 0400-0500 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | 21465am | 0400-0500 | USA, KVOH Los Angeles CA | 9785am | |
| 0400-0500 | Cuba, Radio Havana Cuba | 6010na | 9550na | 9820na | | 0400-0500 | USA, KWHR Naalehu HI | 9930as | |
| 0400-0430 | Ecuador, HCJB Quito | 9745am | 12005am | 21455eu | | 0400-0500 | USA, Monitor Radio Intl | 7535eu | 11695af |
| 0400-0450 | Germany, Deutsche Welle | 6015af | 6045na | 6065af | 7160af | 0400-0500 | USA, VOA Washington DC | 5995eu | 6040eu 6140af 7170me |
| 0400-0500 twfa | Guatemala, Radio Cultural | 3300do | | | | 0400-0500 | USA, WEWN Birmingham AL | 7425na | |
| 0400-0500 vl | Italy, IRRS Milan | 7125eu | | | | 0400-0500 vl | USA, WHRI Noblesville IN | 7315am | |
| 0400-0500 | Kenya, Kenya BC Corp | 4935do | | | | 0400-0500 | USA, WINB Red Lion PA | 11950eu | |
| 0400-0500 s | Lebanon, Wings of Hope | 9960me | | | | 0400-0500 | USA, WJCR Upton KY | 7490na | 13595na |
| 0400-0500 smtwh | Malaysia, RTM Radio 4 | 7295do | | | | 0400-0500 smtwhf | USA, WMLK Bethel PA | 9465eu | |
| 0400-0425 | Netherlands, Radio | 6165na | 9590na | | | 0400-0500 | USA, WRNO New Orleans LA | 7395am | |
| 0400-0500 | New Zealand, R NZ Intl | 15115pa | | | | 0400-0500 | USA, WWCR Nashville TN | 5810am | 5935am 7435am |
| 0400-0450 | North Korea, R Pyongyang | 6130as | 15230as | 17755as | | 0400-0500 | USA, WYFR Okeechobee FL | 6065na | 9505na |
| 0400-0500 vl | Papua New Guinea, NBC | 9675do | | | | 0400-0458 | USA, WYFR Okeechobee FL | 9770eu | |
| 0400-0430 | Romania, R Romania Intl | 6155na | 9510na | 9570na | 11830na | 0425-0440 | Italy, RAI Rome | 5990me | 7275eu |
| 0400-0500 | Russia, Radio Moscow Intl | 11940na | | | | 0430-0500 | Australia, ADF Radio | 13525as | |
| 0400-0500 | Russia, Radio Moscow Intl | 5940na | 7205na | 9620na | 9785na | 0430-0500 | Bulgaria, Radio | 9700na | 11720na |
| 0400-0500 | Russia, Radio Moscow Intl | 11765af | 12010as | 12030as | 12050af | 0430-0500 | Ecuador, HCJB Quito | 12005am | 21455eu |
| 0400-0500 | Russia, Radio Moscow Intl | 15180na | 15425na | 16190as | 17655af | 0430-0500 | Nigeria, Radio | 3326do | 4770do 4990do |
| 0400-0500 | Russia, Radio Moscow Intl | 17675as | 17805as | 17890as | 21670na | 0430-0500 | Swaziland, Trans World R | 3200af | 5055af 7125af 7200af |
| 0400-0500 | Russia, Radio Moscow Intl | 21845as | | | | 0430-0500 t | Switzerland, Swiss R Intl | 11620na | |
| 0400-0500 | Russia, Radio Moscow Intl | | | | | 0445-0500 t | Sri Lanka, SLBC Colombo | 9720na | 15425na |

SELECTED PROGRAMS**Sundays**

0400 HCJB (am): Joni and Friends. Joni Erickson-Tada presents help and advice especially for the disabled.
 0405 HCJB (am): Hour of Decision. Evangelist Billy Graham's radio program.
 0410 Voice of America (af): VOA Sunday Morning. See S 0010.
 0410 Voice of America (eu): VOA Sunday Morning. See S 0010.
 0430 BBC: Seeing Stars (6th). A discussion of astronomical observations and special events for the near future.
 0430 BBC: Short Story. Listeners send in their short stories. The Goose (from the U.S.) (13th). Klang Klang the Tikkilwala (from India) (20th). My Brother Jacob (from New Zealand) (23rd).
 0430 HCJB (am): Afterglow. Don Johnson plays religious music.
 0445 BBC: Feature, It's Your Business (16th,23rd,30th). Examining issues that affect businesses of all sizes.
 0445 BBC: Music Feature. Top Scores (6th). Examining the works of some of the best music arrangers.

Mondays

0400 HCJB (am): Songs in the Night. See S 1100.
 0410 Voice of America (af/eu): Newsline. See M 0110.
 0430 BBC: Off the Shelf. Daily readings from the best of world literature.
 0430 HCJB (am): Afterglow Classics. See S 1100.
 0430 Voice of America (af): Daybreak Africa. See M 0300.
 0430 Voice of America (eu): VOA Monday Morning. See S 0010.
 0445 BBC: Features. Turkish Portraits (7th). Profiles of a Turkish filmmaker. I've Got Something to Tell You (14th,21st,28th). NEW. Children express their views about family life in these refreshing perspectives.

Tuesdays

0400 HCJB (am): Insight for Living. See M 1130.
 0410 Voice of America (af/eu): Newsline. See M 0110.
 0430 BBC: Off the Shelf. See M 0430.
 0430 HCJB (am): Nightsounds. See M 1100.
 0430 Voice of America (af): Daybreak Africa. See M 0300.
 0430 Voice of America (eu): VOA Tuesday Morning. See S 0010.
 0445 BBC: On Screen. Film reviews and movie news from around the world.

Wednesdays

0400 HCJB (am): Insight for Living. See M 1130.

0410 Voice of America (af/eu): Newsline. See M 0110.

0430 BBC: Off the Shelf. See M 0430.

0430 HCJB (am): Nightsounds. See M 1100.

0430 Voice of America (af): Daybreak Africa. See M 0300.

0430 Voice of America (eu): VOA Wednesday Morning. See S 0010.

0445 BBC: Country Style. See W 0145.

Thursdays

0400 HCJB (am): Insight for Living. See M 1130.
 0410 Voice of America (af/eu): Newsline. See M 0110.
 0430 BBC: Off the Shelf. See M 0430.
 0430 HCJB (am): Nightsounds. See M 1100.
 0430 Voice of America (af): Daybreak Africa. See M 0300.
 0430 Voice of America (eu): VOA Thursday Morning. See S 0010.

0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0400 HCJB (am): Insight for Living. See M 1130.
 0410 Voice of America (af/eu): Newsline. See M 0110.
 0430 BBC: Off the Shelf. See M 0430.
 0430 HCJB (am): Nightsounds. See M 1100.
 0430 Voice of America (af): Daybreak Africa. See M 0300.
 0430 Voice of America (eu): VOA Friday Morning. See S 0010.
 0445 BBC: Folk Routes. See T 0130.

Saturdays

0400 HCJB (am): Insight for Living. See M 1130.
 0410 Voice of America (af/eu): VOA Saturday Morning. See S 0010.
 0430 BBC: Jazz Now and Then. See A 0145.
 0430 HCJB (am): Nightsounds. See M 1100.
 0445 BBC: Worldbrief. See A 0130.

HAUSER'S HIGHLIGHTS: CANADA

More changes will be coming from Radio Canada International after Daylight Savings Time, but some changes were begun in September as follows:
 New weekday newscast at 1745-1759; multi-target hour at 2030 shifted to 2100.
 Weekday Peacekeepers service 0600 ex-0500. CBC shortened *The Inside Track* to half an hour, Sat 2304, rest of hour filled with another airing of *Royal Canadian Air Farce* at 2331. Replacing *Open House* is a spiritual show with wider scope, *Tapestry*, Sun 2304. Weekend content of the 0100 and 0200 broadcasts swapped—0200 repeats the 2100, and 0100 carries comedy UT Suns, *Quirks & Quarks* Mons. From Oct 31 both an hour later: 0200 on 6120, 9535, 9755, 11725, 11845; 0300 on 6000, 9725, 9755 (RCI via Bill Westenhaver; *CBC Radio Guide* via Tim Flannery)

12:00 AM EST
9:00 PM PST**SHORTWAVE** GUIDE

0500 UTC

FREQUENCIES

| | | | | | | | |
|-----------------|---------------------------|---------|---------|------------------|----------------------------|---------|-------------------------|
| 0500-0530 | Australia, ADF Radio | 13525as | | 0500-0600 | Spain, R Exterior Espana | 9540na | |
| 0500-0600 | Australia, Radio | 9580pa | 9660pa | 0500-0515 t | Sri Lanka, SLBC Colombo | 9720na | 15425na |
| | | 15365pa | 15415as | 0500-0600 | Swaziland, Swazi Radio | 6155af | |
| | | 17795as | 17860pa | 0500-0600 | Swaziland, Trans World R | 5055af | |
| 0500-0600 vl | Australia, VL8A Alice Spg | 4835do | | 0500-0600 vl | Uganda, Radio | 4976do | |
| 0500-0600 vl | Australia, VL8K Katherine | 5025do | | 0500-0600 | United Kingdom, BBC London | 6190af | 6195eu 9410eu 9600af |
| 0500-0600 vl | Australia, VL8T Tent Crk | 4910do | | | | 9640na | 11760me 12095eu 15280as |
| 0500-0600 | Bahrain, Radio | 6010do | | | | 15310as | 15360as 15400af 15420af |
| 0500-0530 | Bulgaria, Radio | 9700na | 11720na | | | 15575as | 17830as 17885af |
| 0500-0600 | Canada, CFCX Montreal | 6005do | | 0500-0600 | USA, KAIJ Dallas TX | 9815am | |
| 0500-0600 | Canada, CFRX Toronto | 6070do | | 0500-0600 | USA, KTBN Salt Lk City UT | 7510am | |
| 0500-0600 | Canada, CFVP Calgary | 6030do | | 0500-0600 | USA, KVOH Los Angeles CA | 9785am | |
| 0500-0600 | Canada, CHNX Halifax | 6130do | | 0500-0600 | USA, KWHR Naalehu HI | 17780as | |
| 0500-0600 | Canada, CKZU Vancouver | 6160do | | 0500-0600 | USA, Monitor Radio Intl | 7535eu | |
| 0500-0530 mtwhf | Canada, RCI Montreal | 6050eu | 6150eu | 0500-0600 | USA, VOA Washington DC | 5995eu | 6035af 6040eu 6140af |
| | | 17840af | | | | 6873af | 7170me 7405af 9530eu |
| 0500-0600 | Costa Rica, R Peace Intl | 7385am | 9400am | 0500-0600 | USA, WHRI Noblesville IN | 7315am | 9495am |
| 0500-0600 | Cuba, Radio Havana Cuba | 6010na | 9820na | 0500-0600 | USA, WINB Red Lion PA | 11950am | |
| 0500-0600 | Ecuador, HCJB Quito | 11925am | 21455eu | 0500-0600 | USA, WJCR Upton KY | 7490na | 13595na |
| 0500-0600 as | Eqt Guinea, R East Africa | 9585af | | 0500-0600 mtwhfa | USA, WMLK Bethel PA | 9465eu | |
| 0500-0550 | Germany, Deutsche Welle | 5960na | 6045na | 0500-0600 | USA, WRNO New Orleans LA | 7395am | |
| 0500-0515 | Israel, Kol Israel | 7465na | 9435na | 0500-0600 | USA, WWCR Nashville TN | 5810am | 5935am 7435am |
| 0500-0600 vl | Italy, IRRS Milan | 7125eu | | 0500-0600 | USA, WYFR Okeechobee FL | 5985na | 11580eu |
| 0500-0600 | Japan, NHK/Radio | 5975eu | 7230eu | 0500-0600 | USA, WYFR Okeechobee FL | 9870af | |
| | | 9725am | 11740as | 0500-0545 | Vatican State, Vatican R | 7360af | 9725af 11570af 11625af |
| 0500-0600 | Kenya, Kenya BC Corp | 4935do | | 0500-0530 | Australia, Botswana, Radio | 3356af | 4830af 7255af |
| 0500-0600 s | Lebanon, Wings of Hope | 9960me | | 0510-0520 | Ghana, GBC Radio 2 | 3366do | |
| 0500-0600 | Malaysia, RTM Radio 4 | 7295do | | 0525-0600 | Australia, Radio | 9660do | 15510as 15565as 17715as |
| 0500-0600 | New Zealand, R NZ Intl | 15115pa | | 0530-0600 | Austria, R Austria Intl | 6015na | 6155eu 13730eu 15410me |
| 0500-0600 | Nigeria, Radio | 3326do | 4770do | 0530-0600 | Georgia, Radio | 17870me | |
| 0500-0600 | Nigeria, Voice of | 7255af | | 0530-0600 | Romania, R Romania Intl | 11910as | |
| 0500-0550 | North Korea, R Pyongyang | 9640me | 9977af | 0530-0600 | Serbia, Radio Yugoslavia | 11810af | 15340af 15380af 17790af |
| 0500-0530 m | Norway, Radio Norway Intl | 5905na | | 0530-0545 as | Swaziland, Trans World R | 7125af | |
| 0500-0600 vl | Papua New Guinea, NBC | 9675do | | 0530-0600 | Swaziland, Trans World R | 9500af | 9650af |
| 0500-0600 | Russia, Radio Moscow Intl | 7205na | 9620na | 0530-0600 | UAE, Radio Dubai | 15435as | 17830as 21700as |
| | | 9760na | 9880as | 0530-0600 a | New Zealand, R NZ Intl | 9700pa | |
| 0500-0600 | S Africa, Channel Africa | 15180na | 15425na | | | | |
| 0500-0553 f | Seychelles, FEBA Radio | 17570af | 17675as | | | | |
| | | 5995af | 9695af | | | | |
| | | 17725me | | | | | |

SELECTED PROGRAMS**Sundays**

0500 KTBN: Real Videos. Music videos with a Christian theme.
 0509 HCJB (am): DX Partyline. See S 0109.
 0510 Voice of America (af/eu): VOA Sunday Morning. See S 0010.
 0530 KTBN: Leon and Friends. Christian rap music.
 0545 HCJB (am): What in the World. See S 0145.

Mondays

0500 KTBN: Praise the Lord. Music, talk, and guest evangelists from the PTL Network.
 0509 HCJB (am): Saludos Amigos. See M 0109.
 0510 Voice of America (af/eu): VOA Business Report. See M 0010.
 0530 Voice of America (af/eu): VOA Monday Morning. See S 0010.
 0545 HCJB (am): Quest. See M 0145.

Tuesdays

0500 HCJB (am): Studio 9. See T 0100.
 0500 KTBN: Praise the Lord. See M 0500.
 0510 HCJB (am): Features and Interviews. See T 0110.
 0510 Voice of America (af/eu): VOA Business Report. See M 0010.
 0530 HCJB (am): You Should Know. See T 0130.
 0530 Voice of America (af/eu): VOA Tuesday Morning. See S 0010.

Wednesdays

0500 HCJB (am): Studio 9. See T 0100.
 0500 KTBN: Praise the Lord. See M 0500.
 0510 HCJB (am): Features and Interviews. See T 0110.
 0510 Voice of America (af/eu): VOA Business Report. See M 0010.
 0530 HCJB (am): El Mundo Futuro. See W 0130.
 0530 Voice of America (af/eu): VOA Wednesday Morning. See S 0010.

Thursdays

0500 HCJB (am): Studio 9. See T 0100.
 0510 HCJB (am): Features and Interviews. See T 0110.
 0510 Voice of America (af/eu): VOA Business Report. See M 0010.

0530 HCJB (am): Ham Radio Today. See H 0130.
 0530 Voice of America (af/eu): VOA Thursday Morning. See S 0010.

Fridays

0500 HCJB (am): Studio 9. See T 0100.
 0500 KTBN: Praise the Lord. See M 0500.
 0510 HCJB (am): Features and Interviews. See T 0110.
 0510 Voice of America (af/eu): VOA Business Report. See M 0010.
 0530 HCJB (am): What's Cooking in the Andes? See F 0130.
 0530 Voice of America (af/eu): VOA Friday Morning. See S 0010.

Saturdays

0500 HCJB (am): Studio 9. See T 0100.
 0500 KTBN: Behind the Scenes. See S 0600.
 0510 HCJB (am): Features and Interviews. See T 0110.
 0510 Voice of America (af/eu): VOA Saturday Morning. See S 0010.
 0530 HCJB (am): Musica del Ecuador. See A 0130.
 0530 KTBN: Let's Have Church. Mike Purkey conducts the services.

WRNO SPORTS COVERAGE

The football season is wrapping up, and you can follow four teams anywhere you go with WRNO: on Saturdays listen for the LSU Tigers, Texas A&M Aggies, and U of Florida Gators; Sundays you can follow the New Orleans Saints. (All times Central.)

| | | | |
|--------------|-------------------|------|----------|
| Nov 5 | LSU vs Alabama | 7 pm | 7355 kHz |
| | A&M vs Texas | 1 pm | 15420 |
| Nov 6 | Saints vs Vikings | 12pm | 15420 |
| Nov 12 | LSU vs So Miss | 7 pm | 7355 |
| | A&M vs Louisville | 4 pm | 15420 * |
| Nov 13 | Saints vs Falcons | 12pm | 15420 |
| Nov 19 | LSU vs Tulane | 7 pm | 7355 |
| | A&M vs TCU | 1 pm | 15240 |
| Nov 20 | Saints vs Raiders | 3 pm | 15420 * |
| Nov 26 | LSU vs Arkansas | 1 pm | 15420 |
| Nov 28 (Mon) | Saints vs 49ers | 8 pm | 7355 |
| Dec 4 | Saints vs Rams | 3 pm | 15420 * |
| Dec 11 | Saints vs Falcons | 7 pm | 7355 |
| Dec 19 (Mon) | Saints vs Cowboys | 8 pm | 7355 |
| Dec 24 (Sat) | Saints vs Broncos | 3 pm | 15420 * |

*Frequency changes to 7355 at 5 pm

**DON'T MISS OUT ON THE OVERNIGHT ACTION!!
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FREQUENCIES

| | | | | | | | | | | | |
|------------------|---------------------------|-------------------|--------------------|--------------------|--------------------|------------------|----------------------------|--------------------|--------------------|---------|---------|
| 0600-0700 | Australia, Radio | 9660do 17715as | 11910pa 17880as | 13755pa | 15510as | | | 17675as 21670na | 17860as 21725me | 17890as | 21625as |
| 0600-0630 | Australia, Radio | 13605as | 15240pa | 15415pa | 17795as | 0600-0700 | S Africa, Channel Africa | 15220af | | | |
| 0600-0700 vl | Australia, VL8A Alice Spg | 4835do | | | | 0600-0700 | Slovakia, AWR Europe | 13715as | | | |
| 0600-0700 vl | Australia, VL8K Katherine | 5025do | | | | 0600-0630 vl | Solomon Islands, SIBC | 5020do | 9545do | | |
| 0600-0700 vl | Australia, VL8T Tent Crk | 4910do | | | | 0600-0700 | South Korea, R Korea Intl | 11945na | 15155na | | |
| 0600-0700 | Bahrain, Radio | 6010do | | | | 0600-0700 | Swaziland, Swazi Radio | 6155af | | | |
| 0600-0700 | Canada, CFCX Montreal | 6005do | | | | 0600-0700 | Swaziland, Trans World R | 6070af | 9500af | 9650af | |
| 0600-0700 | Canada, CFRX Toronto | 6070do | | | | 0600-0615 | Switzerland, Swiss R Intl | 3985eu | 6165eu | | |
| 0600-0700 | Canada, CFVP Calgary | 6030do | | | | 0600-0700 | United Kingdom, BBC London | 6005af | 6180eu | 6195af | 9410eu |
| 0600-0700 | Canada, CHNX Halifax | 6130do | | | | | | 9560af | 9640na | 11760me | 11940af |
| 0600-0700 | Canada, CKZU Vancouver | 6160do | | | | | | 11955as | 12095eu | 15280as | 15310as |
| 0600-0700 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | | | 15360as | 15400af | 15575eu | 17790as |
| 0600-0700 | Cuba, Radio Havana Cuba | 9820na | | | | | | 17830as | 17885af | | |
| 0600-0700 | Ecuador, HCJB Quito | 11925am | 21455eu | | | 0600-0700 | USA, KAIJ Dallas TX | 9815am | | | |
| 0600-0700 as | Eqt Guinea, R East Africa | 9585af | | | | 0600-0700 | USA, KTBN Salt Lk City UT | 7510na | | | |
| 0600-0650 | Germany, Deutsche Welle | 6100af 15185af | 9565af 17820af | 11765af 21705af | 13790af | 0600-0700 | USA, KVOH Los Angeles CA | 9785am | | | |
| 0600-0630 | Ghana, GBC Radio 1 | 4915do | | | | 0600-0700 | USA, KWHR Naalehu HI | 17780as | | | |
| 0600-0615 | Ghana, GBC Radio 2 | 3366do | | | | 0600-0700 | USA, Monitor Radio Intl | 7535eu | | | |
| 0600-0700 vl | Italy, IRRS Milan | 7125eu | | | | 0600-0700 | USA, VOA Washington DC | 6035af | 6040eu | 6060eu | 6140af |
| 0600-0700 | Japan, NHK/Radio | 9680as | 11860as | 21610as | | 0600-0700 | | 7170me | 7325me | 7405af | 9530af |
| 0600-0625 | Kenya, Kenya BC Corp | 4935do | | | | 0600-0700 | | 9665af | 11805af | 11825af | 11950af |
| 0600-0700 vl | Kiribati, Radio | 9825do | | | | 0600-0700 | USA, WEWN Birmingham, AL | 7425na | | | |
| 0600-0630 | Laos, National Radio of | 7116as | | | | 0600-0700 | USA, WHRI Noblesville IN | 7315am | 9495am | | |
| 0600-0700 s | Lebanon, Wings of Hope | 9960me | | | | 0600-0700 | USA, WINB Red Lion PA | 11950na | | | |
| 0600-0700 | Liberia, Radio ELWA | 4760do | | | | 0600-0700 | USA, WJCR Upton KY | 7490na | 13595na | | |
| 0600-0700 smtwha | Malaysia, RTM Radio 4 | 7295do | | | | 0600-0700 smtwhf | USA, WMLK Bethel PA | 9465eu | | | |
| 0600-0700 | Malaysia, Voice of | 6175as | 9750as | 15295as | | 0600-0700 | USA, WWCR Nashville TN | 5810am | 5935am | 7435am | |
| 0600-0700 | Malta, V of Mediterranean | 9765me | | | | 0600-0700 | USA, WYFR Okeechobee FL | 5985na | 7355eu | 11770eu | 13695af |
| 0600-0700 | New Zealand, R NZ Intl | 15115pa | | | | 0600-0700 | Yemen, Yemeni Rep Radio | 9780do | | | |
| 0600-0700 as | New Zealand, R NZ Intl | 9700pa | | | | 0625-0700 | Kenya, Kenya BC Corp | 4935do | | | |
| 0600-0700 | Nigeria, Radio | 3970do | 4770do | 4990do | | 0630-0700 | Australia, Radio | 9580pa | 9860pa | 11880pa | 15415as |
| 0600-0700 | Nigeria, Voice of | 7255af | 15230as | | | 0630-0700 | | 21725as | | | |
| 0600-0650 | North Korea, R Pyongyang | 15180as | | | | 0630-0700 | Austria, R Austria Intl | 6015na | | | |
| 0600-0700 vl | Papua New Guinea, NBC | 9675do | | | | 0630-0700 | Vatican State, Vatican R | 7360af | 9725af | 11625af | 15570af |
| 0600-0700 | Russia, Radio Moscow Intl | 7205na 15010as | 9865eu 15180na | 12010na 15190eu | 12050na 15425na | 0632-0641 | Romania, R Romania Intl | 9550eu | 9665eu | 11810eu | |
| | | 15470me | 15540as | 15560me | 16190as | 0645-0700 | Romania, R Romania Intl | 11775pa | 15250pa | 15335pa | 17720pa |
| | | | | | | | | 17805pa | | | |

SELECTED PROGRAMS**Sundays**

0600 HCJB (am): Solstice. See S 0230.
 0600 KTBN: Behind the Scenes. TBN news, letters, and reports with Paul Krause.
 0610 Voice of America (af/eu): VOA Sunday Morning. See S 0010.
 0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
 0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
 0630 HCJB (am): Musical Mailbag. See S 0030.
 0630 KTBN: Highway to Heaven. Jeff Van Horn offers advice to juveniles.

Mondays

0600 HCJB (am): Radio Reading Room. See M 0200.
 0600 KTBN: Dwight Thompson. Dwight Thompson
 0600 Voice of America (af): Daybreak Africa. See M 0300.
 0610 Voice of America (eu): Newsline. See M 0110.
 0615 BBC: The Learning World. News and views about worldwide education.
 0630 BBC: Features. See S 1401.
 0630 HCJB (am): The Sower. See M 0300.
 0630 KTBN: Roberts Liardon. From Embassy Christian Center, Costa Mesa, CA.
 0630 Voice of America (eu): VOA Monday Morning. See S 0010.
 0645 HCJB (am): Glorious Intentions. Paul Bell of HCJB examines principles to guide you in facing life in our times.

Tuesdays

0600 HCJB (am): Master Control. See T 0200.
 0600 KTBN: Jack Van Impe Presents. Reporting and interpreting international news.
 0600 Voice of America (af): Daybreak Africa. See M 0300.
 0610 Voice of America (eu): Newsline. See M 0110.
 0615 BBC: The World Today. See M 1645.
 0630 BBC: Music Features. Sampling Made Whole (1st). Examining the process of mixing pop recordings and detecting illegal ones. Megaphones to Microphones (8th, 15th, 22nd, 29th). NEW. This six-part series examines the history and evolution of the "crooner".

Wednesdays

0600 HCJB (am): Unshackled. See W 0200.
 0600 Voice of America (af): Daybreak Africa. See M 0300.
 0610 Voice of America (eu): Newsline. See M 0110.
 0615 BBC: The World Today. See M 1645.
 0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.
 0630 HCJB (am): Blues, Rags, and All That Jazz. See W 0230.
 0630 KTBN: This is Your Day! See T 0630.
 0630 Voice of America (eu): VOA Wednesday Morning. See S 0010.

Thursdays

0600 HCJB (am): The Latest Catch. See H 0200.
 0600 Voice of America (af): Daybreak Africa. See M 0300.
 0610 Voice of America (eu): Newsline. See M 0110.
 0615 BBC: The World Today. See M 1645.
 0615 HCJB (am): The Book Nook. See H 0215.
 0630 BBC: Sports International. See H 0230.
 0630 HCJB (am): Woman to Woman. Focus on topics of concern.
 0630 KTBN: This is Your Day! See T 0630.
 0630 Voice of America (eu): VOA Thursday Morning. See S 0010.

Fridays

0600 HCJB (am): Unshackled. See W 0200.
 0600 KTBN: Dean and Mary. Dean and Mary Brown with music that ministers.
 0600 Voice of America (af): Daybreak Africa. See M 0300.
 0610 Voice of America (eu): Newsline. See M 0110.
 0615 BBC: The World Today. See M 1645.
 0630 BBC: Meridian Books. See W 0630.
 0630 HCJB (am): On Track. Good contemporary music and helpful thoughts.
 0630 KTBN: This is Your Day! See T 0630.
 0630 Voice of America (eu): VOA Friday Morning. See S 0010.

Saturdays

0600 HCJB (am): On-Line. See A 0200.
 0600 KTBN: When Someone Loves You.... Jess Moody sermonizes.
 0610 Voice of America (af/eu): VOA Saturday Morning. See S 0010.
 0615 BBC: The World Today. See M 1645.
 0630 BBC: Meridian Reports. See W 0630.
 0630 HCJB (am): On Track. See F 0630.
 0630 KTBN: This is Your Day! See T 0630.

HAUSER'S HIGHLIGHTS: AUSTRIA

Radio Austria International's Winter schedule in English to North America:

| Time UTC | Frequencies |
|---------------------|------------------|
| 1230 | 13730 |
| 0130 | 9655 |
| 0530 and 0630 | 6015 via Canada |
| To Latin America at | 2330, 0130, 0330 |
| | 9870, 13730 |

(via Gigi Lytle, Diane Mauer, Bob Thomas, Kevin Hecht)
 French DX program UT Suns 0030 on 9655 (Hecht)

0700 UTC

2:00 AM EST/11:00 PM PST

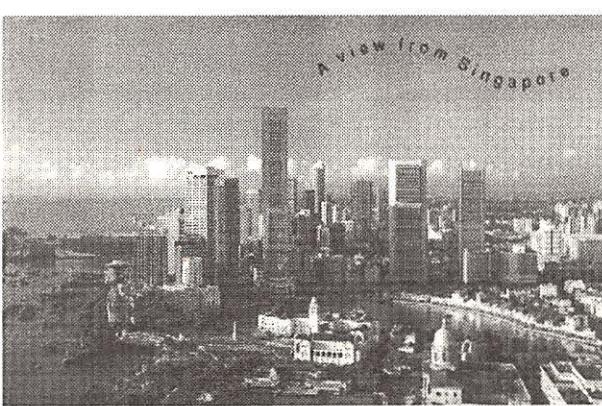
SHORTWAVE GUIDE

0800 UTC

3:00 AM EST/12:00 AM PST

FREQUENCIES

| | | | | | | | | |
|------------------|----------------------------|---|------------------------------|------------------------------|-------------------------------|---|--|--------------------------------------|
| 0700-0800 | Australia, Radio | 6080pa 11880pa 15565as 21715as | 9580pa 11910pa 17695as | 9860pa 13605pa 17750as | 11720pa 15240pa 21595as | 0800-0830 vl 0800-0830 vl 0800-0830 vl 0800-0900 | Australia, VL8A Alice Spg Australia, VL8K Katherine Australia, VL8T Tent Crk Bahrain, Radio | 4835do 5025do 4910do 6010do |
| 0700-0730 | Australia, Radio | 15415as | 17795as | | | 0800-0900 | Canada, CFCX Montreal | 6005do |
| 0700-0800 vl | Australia, VL8A Alice Spg | 4835do | | | | 0800-0900 | Canada, CFRX Toronto | 6070do |
| 0700-0800 vl | Australia, VL8K Katherine | 5025do | | | | 0800-0900 | Canada, CFVP Calgary | 6030do |
| 0700-0800 vl | Australia, VL8T Tent Crk | 4910do | | | | 0800-0900 | Canada, CHNX Halifax | 6130do |
| 0700-0800 | Bahrain, Radio | 6010do | | | | 0800-0900 | Canada, CKZU Vancouver | 6160do |
| 0700-0800 | Canada, CFCX Montreal | 6005do | | | | 0800-0900 | Costa Rica, AWR Alajuela | 5030am |
| 0700-0800 | Canada, CFRX Toronto | 6070do | | | | 0800-0900 | Costa Rica, R Peace Intl | 7385am |
| 0700-0800 | Canada, CFVP Calgary | 6030do | | | | 0800-0830 | Ecuador, HCJB Quito | 9600eu |
| 0700-0800 | Canada, CHNX Halifax | 6130do | | | | | | 21455eu |
| 0700-0800 | Canada, CKZU Vancouver | 6160do | | | | 0800-0900 as | Eqt Guinea, R East Africa | 9585af |
| 0700-0800 | Costa Rica, AWR Alajuela | 6150am | 9725am | | | 0800-0805 s | Ghana, GBC Radio 1 | 4915do |
| 0700-0800 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 0800-0805 s | Ghana, GBC Radio 2 | 3366do |
| 0700-0727 | Czech Rep, Radio Prague | 7345eu | 9505eu | 11990eu | | 0800-0900 | Guam, KTWR Agana | 15200as |
| 0700-0800 | Ecuador, HCJB Quito | 9600eu | 9745pa | 11835eu | 11925pa | 0800-0900 | Indonesia, Voice of Italy, IRRS Milan | 9675as |
| | | 21455eu | | | | 0800-0900 | | 11752as |
| 0700-0800 as | Eqt Guinea, R East Africa | 9585af | | | | 0800-0900 | Kenya, Kenya BC Corp | 4935do |
| 0700-0730 | Georgia, Radio | 11910as | | | | 0800-0830 | Liberia, Radio ELWA | 4760do |
| 0700-0715 | Ghana, GBC Radio 1 | 4915do | | | | 0800-0900 smtwha | Malaysia, RTM Radio 4 | 7295do |
| 0700-0715 | Ghana, GBC Radio 2 | 3366do | | | | 0800-0825 | Malaysia, Voice of Monaco, Trans World Radio | 6175as |
| 0700-0800 vl | Italy, IRRS Milan | 7125eu | | | | 0800-0900 mtwtf | 7120eu | 9750as |
| 0700-0800 | Japan, NHK/Radio | 5975eu | 7230eu | 11740af | 15270af | 0800-0825 | Netherlands, Radio | 11895pa |
| | | 15335me | 15410as | 17810me | 21610au | 0800-0900 mtwhf | New Zealand, R NZ Intl | 9720pa |
| 0700-0800 | Kenya, Kenya BC Corp | 4935do | | | | 0800-0900 | North Korea, R Pyongyang | 9700pa |
| 0700-0800 vl | Kiribati, Radio | 9825do | | | | 0800-0850 | Norway, Radio Norway Intl | 11335na |
| 0700-0800 | Liberia, Radio ELWA | 4760do | | | | 0800-0830 m | Pakistan, Radio | 15175as |
| 0700-0800 smtwha | Malaysia, RTM Radio 4 | 7295do | | | | 0800-0848 | Papua New Guinea, NBC | 17900eu |
| 0700-0800 | Malaysia, Voice of | 6175as | 9750as | 15295as | | 0800-0900 vl | Russia, Radio Moscow Intl | 21520eu |
| 0700-0730 | Myanmar, Radio | 9730do | | | | 0800-0900 | Russia, Radio Moscow Intl | 7315af |
| 0700-0715 | New Zealand, R NZ Intl | 15115pa | | | | 0800-0900 | Sierra Leone, SLBS | 9750af |
| 0700-0800 as | New Zealand, R NZ Intl | 9700pa | | | | 0800-0815 vl | Solomon Islands, SIBC | 12010eu |
| 0700-0800 | Nigeria, Radio | 3326do | 4770do | 4990do | | 0800-0900 | South Korea, R Korea Intl | 12020eu |
| 0700-0800 | Nigeria, Voice of | 7255af | | | | 0800-0830 | South Korea, R Korea Intl | 15125me |
| 0700-0800 vl | Papua New Guinea, NBC | 4890do | | | | 0800-0900 | United Kingdom, BBC London | 15500na |
| 0700-0715 | Romania, R Romania Intl | 11775pa | 15250pa | 15335pa | 17720pa | 0800-0900 | | 17890as |
| | | 17805pa | | | | 0800-0900 | | |
| 0700-0800 | Russia, Radio Moscow Intl | 7205na | 7270na | 9530eu | 9750eu | 0800-0900 | USA, KAIJ Dallas TX | 9815am |
| | | 9890eu | 15220me | 15480me | 15535na | 0800-0900 | USA, KNLS Anchor Point AK | 7365as |
| | | 17695na | 17710af | 17755af | 17835af | 0800-0900 | USA, KTBN Salt Lk City UT | 7510am |
| 0700-0715 vl | Sierra Leone, SLBS | 3316do | | | | 0800-0900 | USA, KWHR Naalehu HI | 9930as |
| 0700-0800 vl | Solomon Islands, SIBC | 5020do | 9545do | | | 0800-0900 | USA, Monitor Radio Intl | 7535eu |
| 0700-0800 | Swaziland, Swazi Radio | 6155af | | | | 0800-0900 | USA, WEWN Birmingham AL | 13615au |
| 0700-0735 | Swaziland, Trans World R | 6070af | 9500af | 9650af | 13635af | 0800-0900 | USA, WHRI Noblesville IN | 7425sa |
| 0700-0730 | Switzerland, Swiss R Intl | 3985eu | 6165eu | 9885af | | 0800-0900 | | 9350na |
| 0700-0800 | Taiwan, VO Free China | 5950na | | | | 0800-0900 | USA, WHRI Noblesville IN | 7315am |
| 0700-0800 | United Kingdom, BBC London | 6005eu | 6180eu | 6190af | 6195eu | 0800-0900 | | 7355am |
| | | 7325eu | 9410eu | 9600af | 9640na | 0800-0900 | USA, WINB Red Lion PA | 11950na |
| | | 11760me | 11940af | 11955as | 12095eu | 0800-0900 | USA, WJCR Upton KY | 7490na |
| | | 15070eu | 15280af | 15310as | 15360as | 0800-0900 smtwhf | USA, WMLK Bethel PA | 9465eu |
| | | 15400eu | 15575eu | 17790as | 17830as | 0800-0900 | USA, WWCR Nashville TN | 5810am |
| | | 17885af | 21660af | | | 0830-0900 vl | Australia, VL8A Alice Spg | 5935am |
| 0700-0800 | USA, KAIJ Dallas TX | 9815na | | | | 0830-0900 vl | Australia, VL8K Katherine | 2310do |
| 0700-0800 | USA, KTBN Salt Lk City UT | 7510na | | | | 0830-0900 vl | Australia, VL8T Tent Crk | 2485do |
| 0700-0800 | USA, KVOH Los Angeles CA | 9785am | | | | 0830-0900 | Austria, R Austria Intl | 2325do |
| 0700-0800 | USA, KWHR Naalehu HI | 17780as | | | | 0830-0900 | Netherlands, Radio | 6155eu |
| 0700-0800 | USA, Monitor Radio Intl | 7535eu | | | | 0830-0900 | Slovakia, R Europe | 9895pa |
| 0700-0800 | USA, WEWN Birmingham AL | 7425am | 9350am | 13615am | | 0830-0900 | Slovakia, R Slovakia Intl | 13730eu |
| 0700-0800 vl | USA, WHRI Noblesville IN | 7315am | 9495am | | | 0830-0900 | Guam, KTWR Agana | 15450as |
| 0700-0800 vl | USA, WINB Red Lion PA | 11950na | | | | 0845-0900 | | 13700pa |
| 0700-0800 | USA, WJCR Upton KY | 9465eu | | | | | | |
| 0700-0800 vl | USA, WMLK Bethel PA | 5810am | 5935am | 7435am | | | | |
| 0700-0800 | USA, WWCR Nashville TN | 11770af | 13695af | | | | | |
| 0700-0800 | USA, WYFR Okeechobee FL | 7355eu | | | | | | |
| 0700-0745 | USA, WYFR Okeechobee FL | 3950eu | 3975eu | 6245eu | 7250eu | | | |
| 0700-0710 mtwhfa | Vatican State, Vatican R | 9645eu | 11740eu | 15210eu | 15570eu | | | |
| 0717-0800 mtwhf | New Zealand, R NZ Intl | 9700pa | | | | | | |
| 0730-0800 | Australia, Radio | 9660pa | 17880as | | | | | |
| 0730-0800 | Belgium, R Vlaanderen Int | 5985eu | 9925au | | | | | |
| 0730-0757 | Czech Rep, Radio Prague | 15605as | 17535as | 21705pa | | | | |
| 0730-0745 sh | Greece, Voice of | 9425eu | 11645eu | 15650eu | | | | |
| 0730-0745 mtwhf | Iceland, Natl BC Service | 9265am | | | | | | |
| 0730-0800 | Netherlands, Radio | 9720pa | 11895pa | | | | | |
| 0735-0800 mtwtf | Swaziland, Trans World R | 6070af | 9500af | | | | | |
| 0740-0800 mtwhf | Monaco, Trans World Radio | 7120eu | | | | | | |
| 0745-0800 | Guam, KTWR Agana | 15200as | | | | | | |



QSL from Radio Singapore International furnished to us by Mark Gingrich of San Leandro, California.

0800 UTC

| | | | | | |
|-----------|----------------------|---------|---------|--------|--------|
| 0800-0900 | Australia, ADF Radio | 15606af | 18191af | | |
| 0800-0900 | Australia, Radio | 5995pa | 6020pa | 6080pa | 9580pa |

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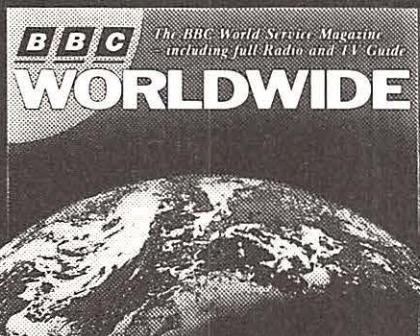
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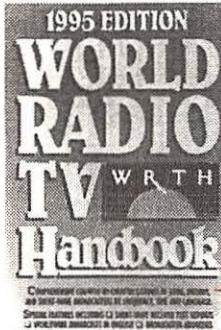
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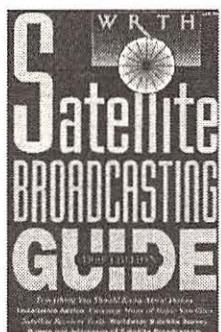
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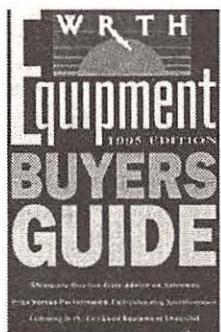
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FREQUENCIES

| | | | | | | | | | | | |
|------------------|----------------------------|------------------------------|------------------------------|-------------------------------|---------|------------------|----------------------------|---------|---------|---------|---------|
| 0900-1000 | Australia, Radio | 9510as 15170as | 9580pa 21725as | 9860pa | 13605as | 1000-1100 | Australia, ADF Radio | 13525as | | | |
| 0900-1000 vl | Australia, VL8A Alice Spg | 2310do | | | | 1000-1100 | Australia, Radio | 9580pa | 9860pa | 15170as | 21725as |
| 0900-1000 vl | Australia, VL8K Katherine | 2485do | | | | 1000-1100 vl | Australia, VL8A Alice Spg | 2310do | | | |
| 0900-1000 vl | Australia, VL8T Tent Crk | 2325do | | | | 1000-1100 vl | Australia, VL8K Katherine | 2485do | | | |
| 0900-1000 | Bahrain, Radio | 6010do | | | | 1000-1100 | Bahrain, Radio | 6010do | | | |
| 0900-1000 | Canada, CFCX Montreal | 6005do | | | | 1000-1030 mtwhfa | Belgium, R Vlaanderen Int | 6035eu | 15510af | 17595af | |
| 0900-1000 | Canada, CFRX Toronto | 6070do | | | | 1000-1100 | Canada, CFCX Montreal | 6005do | | | |
| 0900-1000 | Canada, CFVP Calgary | 6030do | | | | 1000-1100 | Canada, CFRX Toronto | 6070do | | | |
| 0900-1000 | Canada, CHNX Halifax | 6130do | | | | 1000-1100 | Canada, CFVP Calgary | 6030do | | | |
| 0900-1000 | Canada, CKZU Vancouver | 6160do | | | | 1000-1100 | Canada, CHNX Halifax | 6130do | | | |
| 0900-1000 | China, China Radio Intl | 11755pa | 15440pa | 17710pa | | 1000-1100 | Canada, CKZN St John's | 6160do | | | |
| 0900-1000 | Costa Rica, AWR Alajuela | 6150am | 9725am | | | 1000-1100 | Canada, CKZU Vancouver | 6160do | | | |
| 0900-1000 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1000-1100 | China, China Radio Intl | 11755pa | 15440pa | 17710pa | |
| 0900-1000 | Ecuador, HCJB Quito | 9745pa | 11925pa | 21455pa | | 1000-1100 | Costa Rica, AWR Alajuela | 5030am | 5970am | 9725am | |
| 0900-1000 as | Eqt Guinea, R East Africa | 9585af | | | | 1000-1100 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | |
| 0900-0950 | Germany, Deutsche Welle | 6160as 15410af 21650as | 9565af 17780as 21680as | 11715as 17800af 21600af | 12055as | 1000-1100 as | Eqt Guinea, R East Africa | 9745pa | 11925pa | 21455pa | |
| | | | | | | 1000-1100 | India, All India Radio | 9585af | | | |
| | | | | | | 1000-1100 | Italy, IRRS Milan | 15050as | 15180as | 17387au | 17895as |
| 0900-0915 mtwtf | Ghana, GBC Radio 1 | 4915do | | | | 1000-1100 vl | Malaysia, RTM Kota Kinabu | 21460as | | | |
| 0900-0915 | Ghana, GBC Radio 2 | 3366do | | | | 1000-1100 vl | Malaysia, RTM Kota Kinabu | 7125eu | | | |
| 0900-1000 | Guam, KTWR Agana | 11840as | | | | 1000-1100 mtwh | Malaysia, RTM Radio 4 | 5980do | | | |
| 0900-0915 | Guam, KTWR Agana | 15200as | | | | 1000-1030 | Netherlands, Radio | 7295do | | | |
| 0900-1000 vl | Italy, IRRS Milan | 7125eu | | | | 1000-1100 | New Zealand, R NZ Intl | 7260pa | 9720pa | 9810pa | 21505pa |
| 0900-1000 | Japan, NHK/Radio | 9680as | 9750as | 11815as | 15195as | 1000-1100 | North Korea, R Pyongyang | 9700pa | | | |
| 0900-1000 | Malaysia, RTM Radio 4 | 15270au | 7295do | | | 1000-1100 mtwhfa | Palau, KHBN Voice of Hope | 9830as | | | |
| 0900-0920 mtwtf | Monaco, Trans World Radio | 7120eu | | | | 1000-1100 vl | Papua New Guinea, NBC | 4890do | 9675do | | |
| 0900-0930 | Netherlands, Radio | 9720pa | 13700pa | | | 1000-1100 | Philippines, FEBC Manila | 11690as | | | |
| 0900-1000 mtwhf | New Zealand, R NZ Intl | 9700pa | | | | 1000-1100 | Russia, Radio Moscow Intl | 11705na | 11900af | 12010eu | 12020eu |
| 0900-1000 | Nigeria, Radio | 3326do | 4990do | | | 1000-1100 | S Africa, Channel Africa | 15105na | 15355na | 15380eu | 15455na |
| 0900-1000 mtwtfa | Palau, KHBN Voice of Hope | 9830as | | | | 1000-1100 | United Kingdom, BBC London | 15470na | 15485eu | 15500na | 17760na |
| 0900-1000 vl | Papua New Guinea, NBC | 4890do | | | | 1000-1100 | S Africa, Channel Africa | 17780af | | | |
| 0900-1000 | Russia, Radio Moscow Intl | 9680eu | 11805eu | 11900af | 12020eu | 1000-1100 | United Kingdom, BBC London | 17810af | | | |
| | | 12070eu | 13550eu | 15190eu | 15210eu | 1000-1100 | S Africa, Channel Africa | 6190af | 6195as | 7160as | 9410eu |
| | | 15290as | 15345eu | 15355na | 15380eu | 1000-1100 | United Kingdom, BBC London | 9740as | 11750as | 11760me | 11940af |
| | | 15440eu | 15495eu | 15500na | 15540eu | 1000-1100 | S Africa, Channel Africa | 12095eu | 15070eu | 15190sa | 15310as |
| | | 15580as | 17595eu | 17605eu | 17760eu | 1000-1100 | United Kingdom, BBC London | 15400eu | 15575me | 17640eu | 17705eu |
| | | 21515eu | 21540eu | | | 1000-1100 | S Africa, Channel Africa | 17790me | 17830af | 17885af | 21470af |
| 0900-1000 vl | Solomon Islands, SIBC | 5020do | 9545do | | | 1000-1100 | USA, KAIJ Dallas TX | 9815am | | | |
| 0900-0930 | Switzerland, Swiss R Intl | 9885au | 11640au | 13685au | 21820au | 1000-1100 | USA, KTBN Salt Lk City UT | 7510am | | | |
| 0900-1000 | United Kingdom, BBC London | 6190af | 6195as | 9410eu | 9740as | 1000-1100 | USA, KWHR Naaehu HI | 9930as | | | |
| | | 11750as | 11760me | 11940af | 12095eu | 1000-1100 | USA, Monitor Radio Intl | 7395sa | 7535na | 13625pa | 17555as |
| | | 15070eu | 15190sa | 15310as | 15575me | 1000-1100 | USA, VOA Washington DC | 5985pa | 7405am | 9590am | 11720pa |
| | | 17640eu | 17705eu | 17790af | 17830as | 1000-1100 | USA, VOA Washington DC | 11915am | 15120am | 15425pa | |
| 0900-1000 | USA, KAIJ Dallas TX | 9815am | | | | 1000-1100 | USA, WEWN Birmingham AL | 9370as | | | |
| 0900-1000 | USA, KTBN Salt Lk City UT | 7510am | | | | 1000-1100 vl | USA, WHRI Noblesville IN | 7315am | | | |
| 0900-1000 | USA, KWHR Naaehu HI | 9930as | | | | 1000-1100 vl | USA, WINB Red Lion PA | 11950na | | | |
| 0900-1000 | USA, Monitor Radio Intl | 7395sa | 7535eu | 13615pa | 17555as | 1000-1100 | USA, WJCR Upton KY | 7490na | | | |
| 0900-1000 | USA, WEWN Birmingham AL | 9350na | 12160eu | | | 1000-1100 | USA, WWCR Nashville TN | 5935am | | | |
| 0900-1000 vl | USA, WHRI Noblesville IN | 7315am | 7355am | | | 1000-1100 | USA, WYFR Okeechobee FL | 5950na | | | |
| 0900-1000 vl | USA, WINB Red Lion PA | 11950na | | | | 1000-1030 | Vietnam, Voice of | 10059as | 12025as | 15010as | |
| 0900-1000 | USA, WJCR Upton KY | 7490na | 13595na | | | 1020-1030 mtwtfa | Vatican State, Vatican R | 6245eu | 11740af | 15210af | 21730me |
| 0900-1000 smtwhf | USA, WMLK Bethel PA | 9465eu | | | | 1030-1100 mtwhfa | Austria, R Austria Intl | 6155eu | 13730eu | 15450as | 17870au |
| 0900-1000 | USA, WWCR Nashville TN | 5810am | | | | 1030-1100 vl | Malaysia, RTM Sarawak | 4950do | 7160do | | |
| 0910-0940 | Mongolia, R Ulaanbaatar | 11850au | 12050au | | | 1030-1100 | Netherlands, Radio | 7260pa | 9810pa | | |
| 0920-0935 sh | Greece, Voice of | 15650au | 17525au | | | 1030-1100 | Sri Lanka, SLBC Colombo | 11835au | 15120as | 17850as | |
| 0920-0935 a | Monaco, Trans World Radio | 7120eu | | | | 1030-1100 | UAE, Radio Dubai | 13675eu | 15320eu | 15395eu | 21605eu |
| 0920-0945 s | Monaco, Trans World Radio | 7120eu | | | | | | | | | |
| 0930-1000 | Canada, CKZN St John's | 6160do | | | | | | | | | |
| 0930-1000 | Netherlands, Radio | 7260pa | 9720pa | 9810pa | 21505pa | | | | | | |
| 0930-1000 | Philippines, FEBC Manila | 11690as | | | | | | | | | |
| 0940-0950 | Greece, Voice of | 15650au | 17525au | | | | | | | | |

HAUSER'S HIGHLIGHTS: EGYPT

R. Cairo's new 2300-2430 broadcast to us on 9900 contains similar but not identical programming to the 0200-0330 on 9475. News is at 2315 and 0015.

Holy Koran and Interpretation Sun. and Fri. 2305.

Listeners Mail Sun. and Wed. 2345.

Tourism in Egypt Tue. 2335.

Cairo Magazine Thu. 2325 [sic, means 2355?].

Islam in Daily Life Fri. 2335.

American in Egypt UT Sat. 0005.

From Maspero With Love Sat. 2345.

Stamp Collectors Club UT Sun. 0005

(via Bob Thomas, CT)

HAUSER'S HIGHLIGHTS: MALTA

Voice of the Mediterranean, 1400-1500 on 11925 (repeat programming the next day at 0600-0700 on 9765), included these programs one week in July; perhaps typical of other dates:

Sun., Nice 'n' Easy 45--info about Malta.

Mon., WHO Report, Poetic Interludes, Mailbag.

Tue., Ecological Panorama.

Wed., Going Places.

Thu., Malta's Cultural Calendar, DX Corner.

Fri., Great Women, Let's Talk Animals.

Sat., Studies in Maltese Folklore, These We Have Loved

(via Paul Gager, BDXC Communication)

6:00 AM EST
3:00 AM PST

SHORTWAVE GUIDE

1100 UTC

FREQUENCIES

| | | | | | | | | | | | |
|-----------------|---------------------------|-------------------|-------------------|-------------------|-----------|-----------|----------------------------|---------|---------|---------|---------|
| 1100-1200 | Australia, Radio | 9510pa 13605as | 9580pa 15170as | 9710pa 15565as | 9860pa | | | | 17760na | 17825as | 21630af |
| 1100-1200 vl | Australia, VL8A Alice Spg | 2310do | | | | 1100-1115 | Rwanda, Radio | | 6055do | | |
| 1100-1200 vl | Australia, VL8K Katherine | 2485do | | | | 1100-1200 | Singapore, SBC Radio One | 6155do | | | |
| 1100-1200 vl | Australia, VL8T Tent Crk | 2325do | | | | 1100-1200 | Singapore, R Singapore Int | 9530as | | | |
| 1100-1200 | Bahrain, Radio | 6010do | | | | 1100-1130 | Sri Lanka, SLBC Colombo | 11835au | 15120as | 17850as | |
| 1100-1200 | Canada, CFCX Montreal | 6005do | | | | 1100-1130 | Switzerland, Swiss R Intl | 6165eu | 9535eu | 13635as | 15505as |
| 1100-1200 | Canada, CFRX Toronto | 6070do | | | | 1100-1200 | United Kingdom, BBC London | 17515as | | | |
| 1100-1200 | Canada, CFVP Calgary | 6030do | | | | 1100-1130 | United Kingdom, BBC London | 5965na | 5975na | 6190af | 6195na |
| 1100-1200 | Canada, CHNX Halifax | 6130do | | | | 1100-1200 | USA, KAJI Dallas TX | 7160as | 9410eu | 9515na | 9660eu |
| 1100-1200 | Canada, CKZN St John's | 6160do | | | | 1100-1200 | USA, KTBN Salt Lk City UT | 9740as | 11750as | 11760me | 11940af |
| 1100-1200 | Canada, CKZU Vancouver | 6160do | | | | 1100-1200 | USA, KWHR Naalehu HI | 12095af | 15070eu | 15310as | 15575as |
| 1100-1200 | Costa Rica, AWR Alajuela | 5030am | 5970am | | | 1100-1130 | United Kingdom, BBC London | 17640eu | 17885af | 21660af | |
| 1100-1200 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1100-1200 | USA, VOA Washington DC | 5965na | 6110as | 15400eu | 17790sa |
| 1100-1130 | Ecuador, HCJB Quito | 9745pa | 11925pa | 21455pa | | 1100-1200 | USA, WEWN Birmingham AL | 9615as | 9760as | 11720as | 11915am |
| 1100-1200 | Ecuador, HCJB Quito | 15115am | 17890am | 21455pa | 17800af | 1100-1200 | USA, WHRI Noblesville IN | 9350na | 9370as | | |
| 1100-1150 | Germany, Deutsche Welle | 15370af | 17765af | | | 1100-1200 | USA, WJCR Upton KY | 7315am | 9850am | | |
| | | 21600af | | | | 1100-1200 | USA, WWCR Nashville TN | 7490na | 13595na | | |
| 1100-1115 | Ghana, GBC Radio 1 | 4915do | | | | 1100-1200 | USA, WYFR Okeechobee FL | 5810am | 5935am | 15685am | |
| 1100-1130 | Israel, Kol Israel | 15640na | 15650eu | 17575eu | | 1100-1157 | Czech Rep. Radio Prague | 5950na | 11830na | | |
| 1100-1200 vl | Italy, IRRS Milan | 7125eu | | | | 1100-1200 | Iran, VOIRI Tehran | 7345eu | 9505eu | 11990eu | |
| 1100-1200 | Japan, NHK/Radio | 6120na | 9680as | 15295as | | 1100-1200 | Netherlands, Radio | 9525me | 11715me | 11790as | 11910as |
| 1100-1200 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 1100-1200 | South Korea, R Korea Intl | 11930as | | | |
| 1100-1200 | Malaysia, RTM Radio 4 | 7295do | | | | 1100-1200 | Sweden, Radio | 11715na | | | |
| 1100-1200 vl | Malaysia, RTM Sarawak | 4950do | 7160do | | | 1100-1200 | Vietnam, Voice of | 13775as | 15120as | 15240au | |
| 1100-1200 mtwhf | New Zealand, R Ntl | 9700pa | | | | 1100-1200 | Rwanda, Radio | 10059as | 12025as | 15010as | |
| 1100-1150 | North Korea, R Pyongyang | 6576na | 9977na | 11335na | | 1100-1200 | | 6055do | | | |
| 1100-1120 | Pakistan, Radio | 17900as | 21520as | | | | | | | | |
| 1100-1200 mtwhf | Palau, KHBN Voice of Hope | 9830as | | | | | | | | | |
| 1100-1200 vl | Papua New Guinea, NBC | 4890do | 9675do | | | | | | | | |
| 1100-1200 | Russia, Radio Moscow Intl | 11705af | 11800as | 11900as | 11990as | | | | | | |
| | | 12020eu | 13615na | 15105as | 15120as | | | | | | |
| | | 15255as | 15320as | 15355eu | 17710as | | | | | | |
| | | | | | 1145-1200 | | | | | | |

SELECTED PROGRAMS

Sundays

1100 HCJB (am): Afterglow Classics. Don Johnson plays classical religious music.
 1100 HCJB (pa): Songs in the Night. Music and inspiration from Chicago's Moody Church.
 1110 Voice of America (as): New Horizons. The world of science, medicine, and technology.
 1110 Voice of America (ca): Critic's Choice. News from the world of the arts.
 1130 BBC: Play of the Week. Redevelopment (13th). See S 0030.
 1130 BBC: The John Dunn Show (6th, 20th, 27th). See S 0030.
 1130 HCJB (am): Morning Song. Music and thoughts to start the day.
 1130 Voice of America (as): Issues in the News. Members of the Washington press corps discuss current topics.
 1130 Voice of America (ca): Studio One. Dramatized, semi-dramatized, and narrative documentaries. Subjects range from personality profiles to reviews of historic events.

Mondays

1100 HCJB (am): Let My People Think. See S 1500.
 1100 HCJB (pa): Nightsounds. Christian music and thoughtful words from Bill Pearce.
 1110 Voice of America (as): Development Report (Special English). See M 0040.
 1110 Voice of America (ca): Focus. The major figures and issues that shape our world.
 1115 Voice of America (as): This is America (Special English). See M 0045.
 1130 BBC: Composer of the Month. See M 0230.
 1130 HCJB (am): Insight for Living. Chuck Swindoll applies the Bible to life today.
 1130 Voice of America (as): Music USA (Standards). Classics of American popular music.
 1130 Voice of America (ca): VOA Monday Morning. See S 0010.

Tuesdays

1100 HCJB (am): The Living Word. A sermon from Southeast Christian Church.
 1100 HCJB (pa): Nightsounds. See M 1100.
 1110 Voice of America (as): Agriculture Report (Special English). See T 0340.
 1110 Voice of America (ca): Focus. See M 1110.
 1115 Voice of America (as): Science in the News (Special

Wednesdays

1100 HCJB (am): Back to God Hour. The Christian Reformed Church looks at life in light of the historic Christian faith.
 1100 HCJB (pa): Nightsounds. See M 1100.
 1110 Voice of America (as): Science Report (Special English). See W 0040.
 1110 Voice of America (ca): Focus. See M 1110.
 1115 Voice of America (as): Space and Man (Special English). See W 0045.
 1130 BBC: Meridian Documentary. See W 0630.
 1130 HCJB (am): Insight for Living. See M 1130.
 1130 Voice of America (as): Now Music USA. See T 1130.
 1130 Voice of America (ca): VOA Wednesday Morning. See S 0010.

Thursdays

1100 HCJB (am): Christian Brotherhood Hour. Christian messages of inspiration.
 1100 HCJB (pa): Nightsounds. See M 1100.
 1110 Voice of America (as): Science Report (Special English). See W 0040.
 1110 Voice of America (ca): Focus. See M 1110.
 1115 Voice of America (as): The Making of a Nation (Special English). See H 0045.
 1130 BBC: Thirty-Minute Drama. Death Comes Staccato (3rd, 10th, 16th). A female private eye investigates a case involving a young musician and a small electronics company. Six Feet Under (30th). Three elderly hospital patients take desperate measures to get the treatment they need.
 1130 HCJB (am): Insight for Living. See M 1130.
 1130 Voice of America (as): Now Music USA (Top Ten). Top ten pop music hits of the week in the U.S.A.
 1130 Voice of America (ca): VOA Thursday Morning. See S 0010.

Fridays

1100 HCJB (am): Haven of Rest. Evangelizing and The Haven Quartet.

1100 HCJB (pa): Nightsounds. See M 1100.
 1110 Voice of America (as): Environment Report (Special English). A five-minute report on a specific environmental subject.
 1110 Voice of America (ca): Focus. See M 1110.
 1115 Voice of America (as): American Mosaic (Special English). Reports about music, books, movies, and student life in the U.S.A.
 1130 BBC: Meridian Books. See W 0630.
 1130 HCJB (am): Insight for Living. See M 1130.
 1130 Voice of America (as): Country Music USA. Currently popular tunes with a generous sprinkling of old favorites. On Friday broadcasts of Music, U.S.A.
 1130 Voice of America (ca): VOA Friday Morning. See S 0010.

Saturdays

1100 HCJB (am): Hour of Decision. See S 0405.
 1100 HCJB (pa): Afterglow. See S 0430.
 1110 Voice of America (as/ca): Agriculture Today. See S 0010.
 1130 BBC: Meridian Reports. See W 0630.
 1130 HCJB (am): Words of Hope. David Bass provides the message.
 1130 Voice of America (as): Press Conference USA. See S 0130.
 1130 Voice of America (ca): Music USA (Standards). See M 1130.

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1200 UTC

SHORTWAVE

7:00 AM EST

4:00 AM PST

FREQUENCIES

| | | | | | | | | | | | | |
|-----------------|---------------------------|------------------|-------------------|-------------------|---------|-------------------|----------------------------|---------|--------------------|--------------------|--------------------|--------------------|
| 1200-1230 | Australia, Radio | 5995pa 9610as | 6060pa 11800pa | 6080pa 15565as | 9580pa | | | | 15350af 15485eu | 15355na 15500na | 15440eu 15525af | 15470me 17760na |
| 1200-1300 vl | Australia, VL8A Alice Spg | 2310do | | | | 1200-1300 | Singapore, SBC Radio One | 6155do | | | | |
| 1200-1300 vl | Australia, VL8K Katherine | 2485do | | | | 1200-1300 | Singapore, R Singapore Int | 9530as | | | | |
| 1200-1300 vl | Australia, VL8T Tent Crk | 2325do | | | | 1200-1300 | South Korea, R Korea Intl | 7180as | | | | |
| 1200-1300 | Bahrain, Radio | 6010do | | | | 1200-1300 | Taiwan, VO Free China | 7130au | 9610as | | | |
| 1200-1300 | Brazil, Radiobras | 15445na | | | | 1200-1300 | United Kingdom, BBC London | 6190af | 6195na | 7160as | 9410eu | |
| 1200-1215 | Cambodia, Natl Voice of | 11940as | | | | | | 9515na | 9740as | 9760eu | 11750as | |
| 1200-1300 | Canada, CFCX Montreal | 6005do | | | | | | 11760me | 11940af | 12095af | 15070eu | |
| 1200-1300 | Canada, CFRX Toronto | 6070do | | | | | | 15220na | 15310as | 15575as | 17640eu | |
| 1200-1300 | Canada, CFVP Calgary | 6030do | | | | | | 17790af | 17885af | 21660na | | |
| 1200-1300 | Canada, CHNX Halifax | 6130do | | | | 1200-1300 | USA, KAIJ Dallas TX | 9815am | | | | |
| 1200-1300 | Canada, CKZN St John's | 6160do | | | | 1200-1300 | USA, KTBN Salt Lk City UT | 7510am | | | | |
| 1200-1300 | Canada, CKZU Vancouver | 6160do | | | | 1200-1300 vl | USA, KWHR Naalehu HI | 9930as | | | | |
| 1200-1300 mtwhf | Canada, RCI Montreal | 9635na | 11855na | 17820na | 11795pa | 1200-1300 | USA, Monitor Radio Intl | 9425pa | 9455am | 13625as | | |
| 1200-1300 | China, China Radio Intl | 9655na | 9715as | 11660as | 11795pa | 1200-1300 s | USA, Radio Miami Intl | 9955am | | | | |
| | | 15440pa | | | | 1200-1300 | USA, VOA Washington DC | 6110as | 9645as | 9760as | 11715as | |
| 1200-1300 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1200-1300 | USA, WEWN Birmingham AL | 9350na | | | | |
| 1200-1300 | Ecuador, HCJB Quito | 15115am | 17890am | 21455pa | | 1200-1300 vl | USA, WHRI Noblesville IN | 7315am | 9850am | | | |
| 1200-1256 | France, Radio France Intl | 9805eu | 13625af | 13640af | 15155eu | 1200-1300 | USA, WJCR Upton KY | 7490na | 13595na | | | |
| 1200-1230 | Iran, VOIRI Tehran | 9525me | 11715me | 11790as | 11910as | 1200-1300 | USA, WWCR Nashville TN | 5810am | 13845am | 15685am | | |
| 1200-1300 vl | Italy, IRRS Milan | 7125eu | | | | 1200-1300 | USA, WYFR Okeechobee FL | 5950na | 6015na | 11830na | 17750na | |
| 1200-1300 | Jordan, Radio | 9560eu | | | | 1200-1230 | Uzbekistan, R Tashkent | 7285eu | 9715eu | 15295eu | 17745eu | |
| 1200-1300 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 1207-1300 occsnal | New Zealand, R NZ Intl | 9700pa | | | | |
| 1200-1300 | Malaysia, RTM Radio 4 | 7295do | | | | 1215-1300 | Egypt, Radio Cairo | 17595as | | | | |
| 1200-1230 | Mongolia, R Ulaanbaatar | 11850as | 12050as | | | 1220-1230 vl | Ghana, GBC Radio 1 | 4915do | | | | |
| 1200-1300 | Netherlands, Radio | 6045eu | 7130eu | | | 1230-1300 | Australia, Radio | 5995pa | 6060pa | 7260as | 11800pa | |
| 1200-1206 mtwhf | New Zealand, R NZ Intl | 9700pa | | | | 1230-1200 | Austria, R Austria Intl | 6155eu | 13730na | 15450as | | |
| 1200-1230 s | Norway, Radio Norway Intl | 11850as | 15165au | | | 1230-1300 | Bangladesh, Radio | 9548as | 13615as | | | |
| 1200-1300 mtwhf | Palau, KHBN Voice of Hope | 9830as | | | | 1230-1300 | Canada, RCI Montreal | 9660as | 15195as | | | |
| 1200-1230 a | Palau, KHBN Voice of Hope | 9830as | | | | 1230-1300 mtwhfa | Finland, YLE/Radio | 11735na | 15400na | | | |
| 1200-1300 vl | Papua New Guinea, NBC | 4890do | 9675do | | | 1230-1300 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as | | |
| 1200-1300 | Russia, Radio Moscow Intl | 9540af | 11705as | 11985eu | 12055eu | 1230-1300 | Sweden, Radio | 15240na | 17870na | | | |
| | | 15105af | 15280af | 15295as | 15335af | 1240-1250 | Vietnam, Voice of | 10059as | 12025as | 15010as | | |
| | | | | | | | Greece, Voice of | 9425af | 11645af | 15650af | | |

SELECTED PROGRAMS**Sundays**

1200 HCJB (am): Kids' Corner. Mr Lizard and friends present a program for children.
 1201 BBC: Plays of the Week. See S 0101.
 1210 Voice of America (as): Encounter. A discussion program presenting opinions on the issues facing America and the world.
 1230 HCJB (am): Your Story Hour. Dramatized children's stories.
 1230 Voice of America (as): Studio One. See S 1130.

Mondays

1200 HCJB (am): Morning in the Mountains. Magazine program of music, features, news, and inspiration.
 1209 BBC: Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.
 1210 Voice of America (as): Newsline. See M 0110.
 1215 BBC: Quiz Counterpoint. A wide-ranging musical quiz.
 1230 HCJB (am): Latin News. Regional news summary.
 1230 Voice of America (as): Magazine Show. Interviews and features about life in America.
 1238 HCJB (am): A Reading from God's Word. A short break for bible reading.
 1245 BBC: Sports Roundup. See S 0315.
 1246 HCJB (am): Guidelines. A five-minute commentary on living from Harold Sala.

Tuesdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
 1209 BBC: Words of Faith. See M 1209.
 1210 Voice of America (as): Newsline. See M 0110.
 1215 BBC: Multitrack: Hit List. See M 2330.
 1230 HCJB (am): Latin News. See M 1230.
 1230 Voice of America (as): Magazine Show. See M 1230.
 1238 HCJB (am): A Reading from God's Word. See M 1238.
 1245 BBC: Sports Roundup. See S 0315.
 1246 HCJB (am): Guidelines. See M 1246.

Wednesdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
 1209 BBC: Words of Faith. See M 1209.
 1210 Voice of America (as): Newsline. See M 0110.
 1215 BBC: New Ideas. See M 1615.
 1230 HCJB (am): Latin News. See M 1230.
 1230 Voice of America (as): Magazine Show. See M 1230.
 1235 BBC: Feature. Among My Souvenirs (2nd,9th); Bred in Tooth

and Claw (16th,23rd,30th). See M 1635.
 1238 HCJB (am): A Reading from God's Word. See M 1238.
 1245 BBC: Sports Roundup. See S 0315.
 1246 HCJB (am): Guidelines. See M 1246.

Thursdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
 1209 BBC: Words of Faith. See M 1209.
 1210 Voice of America (as): Newsline. See M 0110.
 1215 BBC: Multitrack: X-Press. See W 2330.
 1230 HCJB (am): Latin News. See M 1230.
 1230 Voice of America (as): Magazine Show. See M 1230.
 1238 HCJB (am): A Reading from God's Word. See M 1238.
 1245 BBC: Sports Roundup. See S 0315.
 1246 HCJB (am): Guidelines. See M 1246.

Fridays

1200 HCJB (am): Morning in the Mountains. See M 1200.
 1209 BBC: Words of Faith. See M 1209.
 1210 Voice of America (as): Newsline. See M 0110.
 1215 BBC: Features. Heritage (4th,11th,18th). The Australian

Museum in Sydney, Ironbridge Museum in Shropshire, England, and the city of Prague. Teenagers (25th). NEW. This first of two programs examines teenage life before the '50s.

1230 HCJB (am): Latin News. See M 1230.
 1230 Voice of America (as): Magazine Show. See M 1230.
 1238 HCJB (am): A Reading from God's Word. See M 1238.
 1245 BBC: Sports Roundup. See S 0315.
 1246 HCJB (am): Guidelines. See M 1246.

Saturdays

1200 HCJB (am): A Visit With Mrs. G. Bible stories for children.
 1209 BBC: Words of Faith. See M 1209.
 1210 Voice of America (as): Communications World. See S 0110.
 1215 BBC: Multitrack: Alternative. See F 2330.
 1215 HCJB (am): Critter County. Christian Wyrtzen and her friendly critters present a children's program.
 1230 HCJB (am): Adventures in Odyssey. See A 0330.
 1230 Voice of America (as): Weekend Magazine. A look at people and places in the U.S., featuring music and popular culture.
 1245 BBC: Sports Roundup. See S 0315.

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**HAUSER'S HIGHLIGHTS:
GREECE**

Voice of Greece winter schedule to us:
 1300-1450
 English at 1435 on 15630, 17520
 0000-0350
 English at 0130, 0340 on 9420, 9935 and 15650
 The last frequency is actually via Kavala eastward to Australia and, it is hoped, longpath to western N. America.
 (John Babbis, MD)

8:00 AM EST
5:00 AM PST

SHORTWAVE GUIDE

1300 UTC

FREQUENCIES

| | | | | | | | | | | | |
|-------------------|----------------------------|---------|---------|---------|---------|-------------------|-----------------------------|---------|---------|---------|---------|
| 1300-1400 | Australia, Radio | 5995pa | 7240as | 9610as | 11800pa | 1300-1330 | Switzerland, Swiss R Intl | 6190af | 6195na | 7160as | 7180as |
| 1300-1330 | Australia, Radio | 6060pa | 6080as | | | | | 9410eu | 9515na | 9580as | 9740as |
| 1300-1400 vl | Australia, VL8A Alice Spg | 2310do | | | | | | 11750as | 11760me | 11765as | 11820na |
| 1300-1400 vl | Australia, VL8K Katherine | 2485do | | | | | | 11940af | 12095eu | 15070eu | 15220na |
| 1300-1400 vl | Australia, VL8T Tent Crk | 2325do | | | | | | 15310as | 15420af | 15575me | 17640eu |
| 1300-1400 | Bahrain, Radio | 6010do | | | | | | 17705eu | 17790af | 17840na | 17880af |
| 1300-1320 | Brazil, Radiobras | 15445na | | | | | | 17885af | 21470af | 21660af | |
| 1300-1400 | Bulgaria, Radio | 17625au | | | | 1300-1400 | USA, KAIJ Dallas TX | 9815am | | | |
| 1300-1400 vl | Canada, CBC N Quebec Sce | 9625do | | | | 1300-1400 vl | USA, KJES Mesquite NM | 11715na | | | |
| 1300-1400 | Canada, CFCX Montreal | 6005do | | | | 1300-1400 | USA, KNLS Anchor Point AK | 7365as | | | |
| 1300-1400 | Canada, CFRX Toronto | 6070do | | | | 1300-1400 | USA, KTBN Salt Lk City UT | 7510am | | | |
| 1300-1400 | Canada, CFVP Calgary | 6030do | | | | 1300-1400 | USA, Monitor Radio Int'l | 7535na | 9455na | 13625as | |
| 1300-1400 | Canada, CHNX Halifax | 6130do | | | | 1300-1400 s | USA, Radio Miami Int'l | 9955am | | | |
| 1300-1400 | Canada, CKZN St John's | 6160do | | | | 1300-1400 | USA, VOA Washington DC | 6110as | 9645as | 9760as | 11805as |
| 1300-1400 | Canada, CKZU Vancouver | 6160do | | | | | | 15160as | 15425as | | |
| 1300-1400 s | Canada, RCI Montreal | 11955na | 17820na | | | 1300-1400 | USA, WEWN Birmingham AL | 9350na | 15695na | | |
| 1300-1400 | China, China Radio Intl | 9715as | 11660as | 15440pa | | 1300-1400 | USA, WHRI Noblesville IN | 9465am | 15105am | | |
| 1300-1400 vl | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1300-1400 | USA, WJCR Upton KY | 7490na | 13595na | | |
| 1300-1400 | Ecuador, HCJB Quito | 15115am | 17890am | 21455eu | | 1300-1400 | USA, WWCR Nashville TN | 9475am | 13845am | 15685am | |
| 1300-1330 | Egypt, Radio Cairo | 17595as | | | | 1300-1400 | USA, WYFR Okeechobee FL | 5950na | 6015na | 11550as | 11830na |
| 1300-1330 | Ghana, GBC Radio 1 | 4915do | | | | | | 13695na | 17750na | | |
| 1300-1400 vl | Italy, IRRS Milan | 7125eu | | | | 1300-1330 | Uzbekistan, R Tashkent | 7285eu | 9715eu | 15295eu | 17745eu |
| 1300-1400 mtwhfa | Lebanon, Wings of Hope | 9960me | | | | 1307-1400 occsnal | New Zealand, R NZ Intl | 9655pa | | | |
| 1300-1400 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 1330-1400 | Austria, R Austria Intl | 15450as | | | |
| 1300-1400 | Malaysia, RTM Radio 4 | 7295do | | | | 1330-1400 s | Belgium, R Vlaanderen Int'l | 13675na | | | |
| 1300-1325 | Netherlands, Radio | 6045eu | 7130eu | | | 1330-1400 | Canada, RCI Montreal | 9535as | 11795as | 11935eu | 15315eu |
| 1300-1306 occsnal | New Zealand, R NZ Intl | 9700pa | | | | 1330-1400 mtwhfa | Finland, YLE/Radio | 15400na | 17740na | | |
| 1300-1350 | North Korea, R Pyongyang | 13760na | 15230na | | | 1330-1400 tw | Ghana, GBC Radio 1 | 4915do | | | |
| 1300-1330 s | Norway, Radio Norway Intl | 9590eu | | | | 1330-1400 | India, All India Radio | 13750as | 15120as | | |
| 1300-1400 mtwhf | Palau, KHBN Voice of Hope | 9830as | | | | 1330-1400 | Laos, National Radio of | 7116as | | | |
| 1300-1400 | Papua New Guinea, NBC | 4890do | 9675do | | | 1330-1400 | Netherlands, Radio | 9895as | 13700as | 15150as | |
| 1300-1400 | Philippines, FEBC Manila | 11995as | | | | 1330-1400 | Sweden, Radio | 15240na | 17870na | | |
| 1300-1400 | Romania, R Romania Intl | 11940eu | 15365eu | 17720eu | | 1330-1400 | Switzerland, Swiss R Intl | 6165eu | 9535eu | | |
| 1300-1400 | Russia, Radio Moscow Intl | 7305as | 9560as | 9755as | 9895eu | 1330-1400 | Turkey, Voice of | 9675as | | | |
| | | 11705eu | 11960as | 15125na | 15320me | 1330-1355 | UAE, Radio Dubai | 13675eu | 15320eu | 15395as | 21605as |
| | | 15355na | 15360eu | 15440 | 15455me | 1330-1400 | Vietnam, Voice of | 10059as | 12025as | 15010as | |
| | | 15470me | 15480as | 15485eu | 15500na | 1345-1400 vl | Myanmar, Radio | 7185do | | | |
| 1300-1400 | Singapore, SBC Radio One | 6155do | | | | 1345-1400 | Vatican State, Vatican R | 9500au | 12050as | 15585pa | |
| 1300-1400 | Singapore, R Singapore Int | 9530as | | | | | | | | | |
| 1300-1400 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as | | | | | | | |

SELECTED PROGRAMS

Sundays

1300 HCJB (am): Telling the Truth. Stuart Briscoe presents a religious program.
 1310 Voice of America (as): Critic's Choice. See S 1110.
 1330 HCJB (am): Mountain Meditations. A mixture of music and devotional thoughts in an Andean setting.
 1340 Voice of America (as): Words and Their Stories (Special English). See S 0040.
 1345 Voice of America (as): Tuning in the USA (Special English). See S 0045.

Mondays

1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Focus on the Family. Psychologist James Dobson on everyday family matters.
 1330 KTBN: A Call to Action. Jay Sekulow takes an in-depth look at law and justice issues facing Christians.
 1340 Voice of America (as): Development Report (Special English). See M 0040.
 1345 Voice of America (as): This is America (Special English). See M 0045.

Tuesdays

1300 KTBN: Joy. Interviews with Christian authors.
 1305 HCJB (am): Towards Tomorrow. Science program produced in New Zealand.
 1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Focus on the Family. See M 1330.
 1330 KTBN: Alive! Jesuit Priest Michael Manning teaches Christian principles.
 1340 Voice of America (as): Agriculture Report (Special English). See T 0340.
 1345 Voice of America (as): Science in the News (Special English). See T 0345.

Wednesdays

1300 KTBN: Joy. See T 1300.
 1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Focus on the Family. See M 1330.
 1330 KTBN: Kids Club. Variety program for children.
 1340 Voice of America (as): Science Report (Special English).

Thursdays

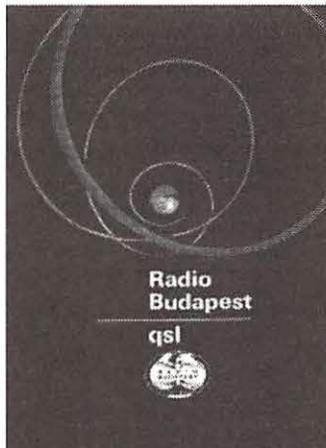
1300 KTBN: Joy. See T 1300.
 1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Focus on the Family. See M 1330.
 1330 KTBN: Doctor to Doctor. Helen Pensanti hosts this program about health.
 1340 Voice of America (as): Science Report (Special English). See W 0040.
 1345 Voice of America (as): The Making of a Nation (Special English). See H 0045.

Fridays

1300 KTBN: Joy. See T 1300.
 1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Focus on the Family. See M 1330.
 1330 KTBN: Revivals in the Land Today. Walt Mills
 1340 Voice of America (as): Environment Report (Special English). See F 1110.
 1345 Voice of America (as): American Mosaic (Special English). See F 1115.

Saturdays

1300 HCJB (am): Children's Bible Hour. Songs and stories for children.
 1300 KTBN: The Filling Station. Teaching children Christian values for daily living.
 1310 Voice of America (as): Focus. See M 1110.
 1330 HCJB (am): Morning in the Mountains. See M 1200.
 1330 KTBN: Kids Club. See W 1330.
 1340 Voice of America (as): In the News (Special English). See F 0040.
 1345 Voice of America (as): American Stories (Special English). See F 0045.



Propagation Forecasting

Jacques d'Avignon
 965 Lincoln Drive
 Kingston On K7M 4Z3 Canada
 Distributor for ASAPS, propagation software CompuServe 70531,140

QSL from Radio Budapest
 contributed by John Neves of
 New York.

FREQUENCIES

| | | | | | | | | | | | |
|-------------------|---------------------------|---------|---------|---------|---------|-----------|----------------------------|---------|---------|---------|---------|
| 1400-1500 | Australia, ADF Radio | 8743af | 10621af | | | 1400-1500 | Russia, Radio Moscow Intl | 6065eu | 7280eu | 7315as | 9560as |
| 1400-1430 | Australia, Radio | 5995pa | 7240pa | 9610pa | 9710pa | | | 9755na | 9820eu | 9890eu | 9895na |
| | | 11800pa | | | | | | 11705na | 11960na | 15105eu | 15125eu |
| 1400-1500 vl | Australia, VL8A Alice Spg | 2310do | | | | 1400-1500 | Singapore, SBC Radio One | 6155do | | | |
| 1400-1500 vl | Australia, VL8K Katherine | 2485do | | | | 1400-1500 | Slovakia, AWR Europe | 13595as | | | |
| 1400-1500 vl | Australia, VL8T Tent Crk | 2325do | | | | 1400-1500 | South Korea, R Korea Intl | 5975as | 7275as | | |
| 1400-1500 | Bahrain, Radio | 6010do | | | | 1400-1500 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as | |
| 1400-1430 mtwhfa | Belgium, R Vlaanderen Int | 13675na | | | | 1400-1500 | United Kingdom, BBC London | 6195as | 7180as | 9410eu | 9515na |
| 1400-1500 vl | Canada, CBC N Quebec Sce | 9625do | | | | 1400-1500 | | 9660eu | 9740as | 9750eu | 11750as |
| 1400-1500 | Canada, CFCX Montreal | 6005do | | | | 1400-1500 | | 11820as | 11940af | 12095eu | 15070eu |
| 1400-1500 | Canada, CFRX Toronto | 6070do | | | | 1400-1500 | | 15260af | 15310me | 15400af | 15575me |
| 1400-1500 | Canada, CFVP Calgary | 6030do | | | | 1400-1500 | | 17640af | 17705eu | 17790af | 17840af |
| 1400-1500 | Canada, CHNX Halifax | 6130do | | | | 1400-1500 | | 17880af | 21660af | | |
| 1400-1500 | Canada, CKZN St John's | 6160do | | | | 1400-1500 | USA, KAIJ Dallas TX | 15725am | | | |
| 1400-1500 | Canada, CKZU Vancouver | 6160do | | | | 1400-1500 | USA, KJES Mesquite NM | 11715na | | | |
| 1400-1500 s | Canada, RCI Montreal | 11955na | 17820na | | | 1400-1500 | USA, KTBN Salt Lk City UT | 7510na | | | |
| 1400-1500 | China, China Radio Intl | 7405na | 11815as | 15165as | | 1400-1500 | USA, Monitor Radio Intl | 9355as | | | |
| 1400-1500 vl | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1400-1500 | USA, VOA Washington DC | 6110as | 7215as | 9645as | 9760as |
| 1400-1430 | Ecuador, HCJB Quito | 15115am | 17890am | 21455eu | | 1400-1500 | | 15160as | 15205as | 15395as | 15425as |
| 1400-1500 | France, Radi France Intl | 11910as | 17560me | 17695eu | | 1400-1500 | USA, WEWN Birmingham AL | 9350na | | | |
| 1400-1420 | Ghana, GBC Radio 1 | 4915do | | | | 1400-1500 | USA, WHRI Noblesville IN | 9465am | 15105am | | |
| 1400-1500 | India, All India Radio | 13750as | 15120as | | | 1400-1500 | USA, WJCR Upton KY | 7490na | 13595na | | |
| 1400-1425 smtwh | Israel, Kol Israel | 15640na | 15650au | | | 1400-1500 | USA, WWCR Nashville TN | 9475am | 13845am | 15685am | |
| 1400-1500 vl | Italy, IRRS Milan | 7125eu | | | | 1400-1500 | USA, WYFR Okeechobee FL | 6015na | 11550as | 11830na | 17750na |
| 1400-1500 | Japan, NHK/Radio | 9535na | 9750as | 11705na | 11840as | 1400-1500 | Bhutan, Bhutan BS | 5025as | | | |
| | | 11955na | | | | 1415-1500 | | 5025as | | | |
| 1400-1500 mtwhfa | Lebanon, Wings of Hope | 9960me | | | | 1415-1425 | Nepal, Radio | 5005do | 7165do | | |
| 1400-1500 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 1430-1500 | Australia, Radio | 5995pa | 6060pa | 6080pa | 7260as |
| 1400-1500 | Malaysia, RTM Radio 4 | 7295do | | | | 1430-1500 | | 9710pa | 9770as | 11660as | 11695pa |
| 1400-1500 vl | Malaysia, RTM Sarawak | 4950do | | | | 1430-1500 | Ecuador, HCJB Quito | 6080do | 17890am | 21455eu | |
| 1400-1500 | Malta, V of Mediterranean | 11925eu | | | | 1430-1500 | Finland, YLE/Radio | 15400na | 17740na | | |
| 1400-1500 s | Morocco, RTV Marocaine | 17595af | | | | 1430-1500 | Myanmar, Radio | 5990do | | | |
| 1400-1500 vl | Myanmar, Radio | 7185do | | | | 1430-1500 | Romania, R Romania Intl | 11775as | 15335as | 17720as | |
| 1400-1500 | Netherlands, Radio | 9895as | 13700as | 15150as | | 1435-1445 | Greece, Voice of | 15630na | 17520na | | |
| 1400-1500 occsnal | New Zealand, R NZ Intl | 9655pa | | | | 1445-1500 | Guam, KTWR Agana | 11580as | | | |
| 1400-1430 mtwhf | Palau, KHBN Voice of Hope | 9830as | | | | 1445-1500 | Mongolia, R Ulaanbaatar | 7260as | 13780as | | |
| 1400-1500 | Philippines, FEBC Manila | 11995as | | | | | | | | | |
| 1400-1455 | Poland, Polish R Warsaw | 6135eu | 7145eu | 7270eu | 9525eu | | | | | | |
| | | 11815eu | | | | | | | | | |

SELECTED PROGRAMS**Sundays**

1400 HCJB (am): Moody Presents. Christian messages from the Moody Bible Institute.
 1401 BBC: Features. Turning Point (6th). Learn about the Whirling Dervishes of Turkey. Help! I'm Going to be a Parent (13th,20th,27th). Parents from different cultural and ethnic backgrounds express their hopes and concerns about becoming parents.
 1410 Voice of America (as): The Concert Hall. Classical music and interviews with America's great artists and conductors.
 1430 BBC: Anything Goes. A variety of music and much more with Bob Holness.
 1455 Voice of America (as): VOA Editorial. Comments expressing the official position of the U.S. Government on various subjects.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Mondays

1400 HCJB (am): Key Life. Steve Brown presents religious advice.
 1405 BBC: Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
 1410 Voice of America (as): Asia Report. Correspondents' reports and background on the news, with emphasis on events in East and South Asia.
 1415 HCJB (am): Our Daily Bread. A daily devotional program from Radio Bible Class.
 1430 BBC: Off the Shelf. See M 0430.
 1430 HCJB (am): Thru the Bible. J. Vernon McGee presents a book-by-book study of the Bible.
 1445 BBC: Music Feature. Top Scores (6th). See S 0445.
 1445 BBC: Feature. It's Your Business (14th,21st,28th). See S 0445.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Tuesdays

1400 HCJB (am): Key Life. See M 1400.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America (as): Asia Report. See M 1410.
 1415 HCJB (am): Our Daily Bread. See M 1415.
 1430 BBC: Off the Shelf. See M 0430.
 1430 HCJB (am): Thru the Bible. See M 1430.
 1445 BBC: Music Feature. Woods, Guts and Brass. See M 0145.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Wednesdays

1400 HCJB (am): Key Life. See M 1400.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America (as): Asia Report. See M 1410.
 1415 HCJB (am): Our Daily Bread. See M 1415.
 1430 BBC: Off the Shelf. See M 0430.
 1430 HCJB (am): Thru the Bible. See M 1430.
 1445 BBC: Good Books. See S 0015.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Thursdays

1400 HCJB (am): Key Life. See M 1400.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America (as): Asia Report. See M 1410.
 1415 HCJB (am): Our Daily Bread. See M 1415.
 1430 BBC: Off the Shelf. See M 0430.
 1430 HCJB (am): Thru the Bible. See M 1430.
 1445 BBC: The Learning World. See M 0615.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Fridays

1400 HCJB (am): Key Life. See M 1400.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America (as): Asia Report. See M 1410.
 1415 HCJB (am): Our Daily Bread. See M 1415.
 1430 BBC: Off the Shelf. See M 0430.
 1430 HCJB (am): Thru the Bible. See M 1430.
 1445 BBC: Global Concerns. See F 0145.
 1455 Voice of America (as): VOA Editorial. See S 1455.

Saturdays

1401 BBC: Sportsworld. The weekly sports magazine.
 1410 Voice of America (as): Music USA (Jazz). Willis Conover hosts the VOA jazz hour.
 1430 HCJB (am): Sounds of Joy. See S 0200.
 1455 Voice of America (as): VOA Editorial. See S 1455.

HAUSER'S HIGHLIGHTS

Australian Defence Forces Radio, Broadcasts directed to remaining guards at Butterworth, Malaysia, air at 0430-0530 live on 18735-USB, repeated at 0930 on same, and 2400 on 13525 via 40 kW Belconnen ACT navy unit. Broadcasts are being tested toward forces in Rwanda, 1700-1900 daily on 10375.5, 10429.5, 10458, 10650 USB, from 60 kW NW Cape navy unit. Defence Forces Radio contain lots of sport, top-40, and voice messages from home (Hugh MacKenzie, ADFR on RNMN)

FREQUENCIES

| | | | | | | | | | | | |
|------------------|---------------------------|-----------------------------|------------------|-------------------|-------------------|-------------------|---|-----------------------------|---------|---------|---------|
| 1500-1600 | Australia, Radio | 5995pa 9710pa 11800pa | 6060pa 9770as | 6080pa 11660as | 7260as 11695pa | 1500-1600 occsnal | New Zealand, R NZ Intl North Korea, R Pyongyang Philippines, FEBC Manila 1500-1600 | 9655pa 9325eu 11995as | 9640af | 9977af | 13185eu |
| 1500-1600 vl | Australia, VL8A Alice Spg | 2310do | | | | 1500-1530 | Romania, R Romania Intl | 11775as | 15335as | 17720as | |
| 1500-1600 vl | Australia, VL8K Katherine | 2485do | | | | 1500-1600 | Russia, Radio Moscow Intl | 6065eu | 9505eu | 9540eu | 9560eu |
| 1500-1600 vl | Australia, VL8T Tent Crk | 2325do | | | | | | 9755af | 9820na | 9895as | 11875eu |
| 1500-1600 | Bahrain, Radio | 6010do | | | | | | 11940as | 15105na | 15180eu | 15320as |
| 1500-1600 | Bulgaria, Radio | 15460as | 17705as | | | | | 15425eu | 15470as | 15500na | 15540eu |
| 1500-1600 vl | Canada, CBC N Quebec Sce | 9625do | | | | | | 15550eu | 17760na | | |
| 1500-1600 | Canada, CFCX Montreal | 6005do | | | | 1500-1543 | Seychelles, FEBA Radio | 9810as | 11870as | | |
| 1500-1600 | Canada, CFRX Toronto | 6070do | | | | 1500-1600 | Seychelles, FEBA Radio | 11870as | | | |
| 1500-1600 | Canada, CFVP Calgary | 6030do | | | | 1500-1600 | Singapore, SBC Radio One | 6155do | | | |
| 1500-1600 | Canada, CHNX Halifax | 6130do | | | | 1500-1600 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as | |
| 1500-1600 | Canada, CKZN St John's | 6160do | | | | 1500-1530 | Switzerland, Swiss R Intl | 11960as | 13635as | 15505as | |
| 1500-1600 | Canada, CKZU Vancouver | 6160do | | | | 1500-1600 | United Kingdom, BBC London | 6190af | 6195as | 7180as | 9410eu |
| 1500-1600 s | Canada, RCI Montreal | 11955na | 17820na | | | | | 9515na | 9740as | 11750as | 11940af |
| 1500-1600 | China, China Radio Intl | 7405na | 11815as | 15165as | | 1500-1600 | USA, KAIJ Dallas TX | 15725am | | | |
| 1500-1600 vl | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | 1500-1600 | USA, KTBN Salt Lk City UT | 15590na | | | |
| 1500-1600 | Ecuador, HCJB Quito | 6080do | 17890am | 21455eu | | 1500-1600 | USA, KWHR Naalehu HI | 9930as | | | |
| 1500-1550 | Germany, Deutsche Welle | 7195af | 9735af | 11965af | 15145af | 1500-1600 | USA, Monitor Radio Intl | 9355as | | | |
| 1500-1600 | Guam, KSDA/AWR Asia | 9370as | | | | 1500-1600 | USA, VOA Washington DC | 6110as | 7125as | 7215as | 9645as |
| 1500-1600 | Guam, KTWR Agana | 11580as | | | | 1500-1600 | USA, WCSN Scotts Cor ME | 9700as | 9760as | 15205me | 15395as |
| 1500-1600 | Iraq, Radio Iraq Intl | 15250as | | | | 1500-1600 | USA, WEWN Birmingham AL | 15665eu | | | |
| 1500-1600 | Italy, AWR Europe | 7230eu | | | | 1500-1600 | USA, WHRI Noblesville IN | 9350na | 17510eu | | |
| 1500-1600 vl | Italy, IRRS Milan | 7125eu | | | | 1500-1600 | USA, WJCR Upton KY | 9465am | 15105am | | |
| 1500-1600 | Japan, NHK/Radio | 9535na | 9750as | 11915as | 11955na | 1500-1600 | USA, WWCR Nashville TN | 7490na | 13595na | | |
| 1500-1600 | Jordan, Radio | 9560eu | | | | 1500-1600 | USA, WYFR Okeechobee FL | 13845am | 15685am | | |
| 1500-1600 mtwhfa | Lebanon, Wings of Hope | 9960me | | | | 1525-1530 twhf | Philippines, Veritas Asia | 11705na | 11830na | 17750na | |
| 1500-1600 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 1530-1600 | Austria, R Austria Intl | 6155eu | 9880me | 11780as | 13730eu |
| 1500-1600 | Malaysia, RTM Radio 4 | 7295do | | | | 1530-1600 | Netherlands, Radio | 9895as | 15150as | | |
| 1500-1600 | Malaysia, RTM Sarawak | 4950do | 7160do | | | 1530-1600 mtwhf | Portugal, Radio | 21515me | | | |
| 1500-1600 | Malta, V of Mediterranean | 11925eu | | | | 1540-1555 asm | Philippines, Veritas | Asia | 15140as | | |
| 1500-1515 | Mongolia, R Ulaanbaatar | 7260as | 13780as | | | | | | | | |
| 1500-1525 | Netherlands, Radio | 9895as | 13700as | 15150as | | | | | | | |

SELECTED PROGRAMS**Sundays**

1500 HCJB (am): Let My People Think. Addressing questions of today's thinking Christians.
 1500 KTBN: Life Today. James Robison tells how to cope with today's problems.
 1510 Voice of America (as/eu): New Horizons. See S 1110.
 1515 BBC: Concert Hall. Classical music concerts.
 1530 HCJB (am): The Urban Alternative. A program for inner-city America from Dallas.
 1530 KTBN: Winning Walk. Ed Young sermonizes from Houston, TX.
 1530 Voice of America (as/eu): Studio One. See S 1130.

Mondays

1500 HCJB (am): Gateway to Joy. Contemporary women's issues from a Biblical perspective.
 1500 KTBN: Breakthrough. Rod Parsley conducts services from the World Harvest Church in Columbus, OH.
 1510 Voice of America (eu): Newsline. See M 0110.
 1515 BBC: Features. See M 0101.
 1530 HCJB (am): Back to the Bible. A mix of music and daily Bible study.
 1530 KTBN: Today with Marilyn. Marilyn Hickey teaches.
 1530 Voice of America (eu): Magazine Show. See M 1230.

Tuesdays

1500 HCJB (am): Gateway to Joy. See M 1500.
 1500 KTBN: Breakthrough. See M 1500.
 1510 Voice of America (eu): Newsline. See M 0110.
 1515 BBC: A Jolly Good Show. See T 0015.
 1530 HCJB (am): Back to the Bible. See M 1530.
 1530 KTBN: Today with Marilyn. See M 1530.
 1530 Voice of America (eu): Magazine Show. See M 1230.

Wednesdays

1500 HCJB (am): Gateway to Joy. See M 1500.
 1500 KTBN: Breakthrough. See M 1500.
 1510 Voice of America (eu): Newsline. See M 0110.
 1515 BBC: From Our Own Correspondent. See S 0330.

1530 BBC: Special Features. Two Cheers for October (2nd). Humorous sketches based on last month's events in the news. Two Cheers for November (30th). A satirical look at November's events in the news.
 1530 BBC: Music Feature. Music, Mirth and Memories of Childhood (9th, 16th, 23rd). An anthology of words and music recorded before an invited audience.

1530 HCJB (am): Back to the Bible. See M 1530.
 1530 KTBN: Today with Marilyn. See M 1530.
 1530 Voice of America (eu): Magazine Show. See M 1230.

Thursdays

1500 HCJB (am): Gateway to Joy. See M 1500.
 1500 KTBN: Breakthrough. See M 1500.
 1510 Voice of America (as/eu): Newsline. See M 0110.
 1515 BBC: The Greenfield Collection. See H 0015.
 1530 HCJB (am): Back to the Bible. See M 1530.
 1530 KTBN: Today with Marilyn. See M 1530.
 1530 Voice of America (as/eu): Magazine Show. See M 1230.

Fridays

1500 HCJB (am): Gateway to Joy. See M 1500.
 1500 KTBN: Breakthrough. See M 1500.
 1510 Voice of America (as/eu): Newsline. See M 0110.
 1515 BBC: Music Review. See F 0015.
 1530 HCJB (am): Back to the Bible. See M 1530.
 1530 KTBN: Today with Marilyn. See M 1530.
 1530 Voice of America (as/eu): Magazine Show. See M 1230.

Saturdays

1500 HCJB (am): Words of Hope. See A 1130.
 1500 KTBN: Joy Junction. Fun and games for children from the Christian Television Network (CTN).
 1510 Voice of America (as/eu): Newsline. See M 0110.
 1515 BBC: Sportsworld. See A 1401.
 1530 HCJB (am): Hour of Decision. See S 0405.
 1530 KTBN: Circle Square. A program for children in a hotel setting.
 1530 Voice of America (as/eu): Press Conference USA. See S 0130.

**HAUSER'S HIGHLIGHTS:
SWEDEN**

Radio Sweden's winter schedule to North America:

1330-1430 11650, 15240

0230-0330 9850, 6200

Latin America in English:

0030 6200, 6065

(via Bob Thomas, Diane Mauer)

(11650 clashes with KFBS in Russian until 1400 - gh)

Looking for a Good Antenna Handbook?

If you'd like a good source of information about antennas, you will be interested in **THE ANTENNA HANDBOOK** by Clem Smoll. Within its 200+, 8-1/2" x 11" pages, there is much material from past "Antenna Topics" columns plus a considerable amount of new material.

It is an excellent source of information for selecting, constructing, understanding, and utilizing your antenna system. Also covered are subjects like the history of antennas, odd and unusual antennas, signal propagation, factors affecting antenna performance, antenna accessories, and antenna troubleshooting.

THE ANTENNA HANDBOOK is available from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902 for \$12.95 plus \$2 book rate postage (\$4.50 UPS).

FREQUENCIES

| | | | | | | | | | | |
|-------------------|---------------------------|---------|---------|---------|---------|-----------------|----------------------------|---------|---------|---------|
| 1600-1700 | Algeria, R Algiers Intl | 11715eu | 17745eu | | | 1600-1700 | S Africa, Channel Africa | 4945af | 11770af | |
| 1600-1630 | Australia, Radio | 5995pa | 6060pa | 6080pa | 7260as | 1600-1700 | South Korea, R Korea Intl | 5975as | | |
| | | 9710pa | 9770as | 11660pa | 11695pa | 1600-1700 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as |
| | | 11800pa | | | | 1600-1700 | Swaziland, Trans World R | 9500af | | |
| 1600-1700 vl | Australia, VL8A Alice Spg | 2310do | | | | 1600-1645 | UAE, Radio Dubai | 11795af | 13675eu | 15435eu |
| 1600-1700 vl | Australia, VL8K Katherine | 2485do | | | | 1600-1700 | United Kingdom, BBC London | 3915as | 6190af | 6195eu |
| 1600-1700 vl | Australia, VL8T Tent Crk | 2325do | | | | | | 9410eu | 9515na | 9580as |
| 1600-1700 | Bahrain, Radio | 6010do | | | | | | 11750as | 12095eu | 15070af |
| 1600-1700 vl | Canada, CBC N Quebec Sce | 9625do | | | | | | 15310as | 15400af | 17640af |
| 1600-1700 | Canada, CFCX Montreal | 6005do | | | | | | 17880af | 21470af | 21660af |
| 1600-1700 | Canada, CFRX Toronto | 6070do | | | | 1600-1700 | USA, KAIJ Dallas TX | 15725am | | |
| 1600-1700 | Canada, CFVP Calgary | 6030do | | | | 1600-1700 | USA, KTBN Salt Lk City UT | 15590am | | |
| 1600-1700 | Canada, CHNX Halifax | 6130do | | | | 1600-1700 | USA, KWHR Naalehu HI | 6120as | | |
| 1600-1700 | Canada, CKZN St John's | 6160do | | | | 1600-1700 | USA, Monitor Radio Intl | 9355af | 21640af | |
| 1600-1700 | Canada, CKZU Vancouver | 6160do | | | | 1600-1700 | USA, VOA Washington DC | 3970af | 6110as | 7125as |
| 1600-1700 | China, China Radio Intl | 11575af | 15110af | 15130af | | | | 9700as | 9760as | 11920af |
| 1600-1700 vl | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | | | 13710af | 15205as | 15225af |
| 1600-1627 | Czech Rep, Radio Prague | 5930as | 7345eu | 13580me | | | | 15395as | 15410af | 15445af |
| 1600-1700 | Ecuador, HCJB Quito | 6080do | 15350eu | 21455eu | | 1600-1700 | USA, WCSN Scotts Cor ME | 15665eu | | |
| 1600-1700 | Ethiopia, Radio | 7165af | 9450af | | | 1600-1700 | USA, WEWN Birmingham AL | 13615na | | |
| 1600-1700 | France, Radio France Intl | 6175eu | 11700af | 12015af | 15530me | 1600-1700 vl | USA, WHRI Noblesville IN | 9465am | 15105am | |
| 1600-1630 | Georgia, Radio | 11910eu | | | | 1600-1700 | USA, WINB Red Lion PA | 15715eu | | |
| 1600-1650 | Germany, Deutsche Welle | 6170as | 7225as | 7305as | 9525as | 1600-1700 | USA, WJCR Upton KY | 7490na | 13595na | |
| 1600-1700 | Guam, KSDA/AWR Asia | 9585as | 11795as | | | 1600-1700 | USA, WRNO New Orleans LA | 15420na | | |
| 1600-1700 | Guam, KTWR Agana | 9370af | | | | 1600-1700 | USA, WWCR Nashville TN | 13845am | 17525am | |
| 1600-1700 | Iran, VOIR Tehran | 11580af | | | | 1600-1700 | USA, WYFR Okeechobee FL | 11705na | 11830na | 15355eu |
| 1600-1627 | Italy, IRRS Milan | 11790eu | | | | | | 21525af | 21615eu | |
| 1600-1700 vl | Jordan, Radio | 7125eu | | | | 1615-1645 | Sweden, Radio | 6065eu | | |
| 1600-1630 | Lebanon, Wings of Hope | 9560eu | | | | 1630-1700 | Australia, Radio | 6060pa | 6080pa | 7260as |
| 1600-1630 mtwhfa | Netherlands, Radio | 9960me | | | | 1630-1700 | 11660pa | 9710pa | | |
| 1600-1625 | New Zealand, R NZ Intl | 9895as | 15150as | | | 1630-1700 | Austria, R Austria Intl | 9860pa | | |
| 1600-1649 occsnal | Pakistan, Radio | 9655pa | 11570af | 13590af | 15555as | 1630-1700 | Canada, RCI Montreal | 7150as | 9550as | |
| 1600-1630 | Russia, Radio Moscow Intl | 9470me | 17660af | 17660pa | | 1630-1700 | Egypt, Radio Cairo | 15255af | | |
| 1600-1700 | Russia, Radio Moscow Intl | 9726na | 9505na | 9540na | 9560na | 1630-1700 | Liberia, Radio ELWA | 4760do | | |
| | | 9755na | 9880eu | 11630eu | 11745eu | 1630-1700 | United Kingdom, BBC London | 3255af | 5965as | 5975as |
| | | 11840na | 11875af | 11940eu | 12050na | 1640-1650 s | Rwanda, Radio | 9630af | 15420af | 7180as |
| | | 12065eu | 13665as | 15105na | 15180na | 1645-1700 | Afghanistan, Radio | 9635as | | |
| | | 15425af | 17760eu | 17875eu | | 1645-1700 | Tajikistan, Radio | 7245as | | |
| | | | | | | 1650-1700 mtwhf | New Zealand, R NZ Intl | 9655pa | | |

SELECTED PROGRAMS**Sundays**

1600 HCJB (om): Songtime Weekend. See S 0330.
 1610 Voice of America (as/eu): Encounter. See S 1210.
 1615 BBC: Features. See S 0230.
 1630 HCJB (om): Afterglow. See S 0430.
 1640 Voice of America (as/eu): Words and Their Stories (Special English). See S 0040.
 1645 BBC: Letter from America. See S 0615.
 1645 Voice of America (as/eu): Tuning in the USA (Special English). See S 0045.
 1657 Voice of America (af): VOA Editorial. See S 1455.

Mondays

1600 HCJB (om): Morning in the Mountains. See M 1200.
 1610 Voice of America (eu): Focus. See M 1110.
 1615 BBC: New Ideas. Window on the world of technology, innovation and new products.
 1630 HCJB (om): Latin News. See M 1230.
 1635 BBC: Feature. Among My Souvenirs (7th). Various personalities tell which possessions they would rescue from their burning house. Bred in Tooth and Claw (14th, 21st, 28th). NEW. A series of four programs that look at the way animals rear their offspring and live as families.
 1638 HCJB (om): A Reading from God's Word. See M 1238.
 1640 Voice of America (eu): Development Report (Special English). See M 0040.
 1645 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.
 1645 Voice of America (as/eu): This is America (Special English). See M 0045.
 1646 HCJB (om): Guidelines. See M 1246.
 1655 Voice of America (af): Sports Journal. Complete sports news for African listeners.

Tuesdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
 1610 Voice of America (as/eu): Focus. See M 1110.
 1615 BBC: Megamix. See T 1130.
 1630 HCJB (om): Latin News. See M 1230.
 1638 HCJB (om): A Reading from God's Word. See M 1238.
 1640 Voice of America (as/eu): Agriculture Report (Special English). See T 0340.
 1645 BBC: The World Today. See M 1645.
 1645 Voice of America (as/eu): Science in the News (Special English). See T 0345.
 1646 HCJB (om): Guidelines. See M 1246.
 1655 Voice of America (af): Sports Journal. See M 1655.

Wednesdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
 1610 Voice of America (as/eu): Focus. See M 1110.
 1615 BBC: Music Features. Sampling Made Whole (2nd); Megaphones to Microphones (9th, 16th, 23rd, 30th). See M 2315.
 1630 HCJB (om): Latin News. See M 1230.
 1638 HCJB (om): A Reading from God's Word. See M 1238.
 1640 Voice of America (as/eu): Science Report (Special English). See W 0040.
 1645 BBC: The World Today. See M 1645.
 1645 Voice of America (as/eu): Space and Man (Special English). See W 0045.
 1646 HCJB (om): Guidelines. See M 1246.
 1655 Voice of America (af): Sports Journal. See M 1655.

Thursdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
 1610 Voice of America (as/eu): Focus. See M 1110.
 1615 BBC: Network UK. Issues and events affecting the lives of people throughout the UK.

1630 HCJB (om): Latin News. See M 1230.

1638 HCJB (om): A Reading from God's Word. See M 1238.

1640 Voice of America (as/eu): Science Report (Special English). See W 0040.

1645 BBC: The World Today. See M 1645.

1645 Voice of America (as/eu): The Making of a Nation (Special English). See H 0045.

1646 HCJB (om): Guidelines. See M 1246.

Fridays

1600 HCJB (om): Morning in the Mountains. See M 1200.
 1610 Voice of America (as/eu): Focus. See M 1110.
 1615 BBC: Science in Action. The latest in science and technology.
 1630 HCJB (om): Latin News. See M 1230.
 1638 HCJB (om): A Reading from God's Word. See M 1238.
 1640 Voice of America (as/eu): Environment Report (Special English). See F 1110.
 1645 BBC: The World Today. See M 1645.
 1645 Voice of America (as/eu): American Mosaic (Special English). See F 1115.
 1646 HCJB (om): Guidelines. See M 1246.

Saturdays

1600 HCJB (om): Morning in the Mountains Weekend. See M 1200.
 1610 Voice of America (as/eu): Communications World. See S 0110.
 1615 BBC: Sportsworld. See A 1401.
 1640 Voice of America (as/eu): In the News (Special English). See F 0040.
 1645 Voice of America (as/eu): American Stories (Special English). See F 0045.
 1655 Voice of America (af): VOA Editorial. See S 1455.

1700 UTC

12:00 PM EST/9:00 AM PST

SHORTWAVE GUIDE

1800 UTC

1:00 PM EST/10:00 AM PST

FREQUENCIES

| | | | | | | | | | | |
|------------------|-----------------------------|---------|---------|---------|---------|-------------------|----------------------------|---------|---------|---------|
| 1700-1713 | Albania, R Tirana | Intl | 7155eu | 9760eu | | 1800-1900 | Ecuador, HCJB Quito | 6080do | 15350eu | 21455eu |
| 1700-1800 | Australia, Radio | 6060pa | 6080pa | 7260as | 9580pa | 1800-1830 | Egypt, Radio Cairo | 15255af | | |
| | | 9710pa | 9860pa | 11660pa | 11695pa | 1800-1900 vl | Eqt Guinea, Radio Africa | 7200af | | |
| | | 11880pa | | | | 1800-1815 | Ghana, GBC Radio 1 | 4915do | | |
| 1700-1800 vl | Australia, VL8A Alice Spg | 2310do | | | | 1800-1900 | Ghana, GBC Radio 2 | 3316do | | |
| 1700-1800 vl | Australia, VL8K Katherine | 2485do | | | | | India, All India Radio | 7412eu | 9650me | 9950me |
| 1700-1800 vl | Australia, VL8T Tent Crk | 2325do | | | | | | 11935af | 15075af | 11620eu |
| 1700-1800 | Azerbaijan, Voice of | 7160eu | | | | 1800-1900 vl | Italy, IRRS Milan | 7125eu | | |
| 1700-1800 | Bahrain, Radio | 6010do | | | | 1800-1900 | Kuwait, Radio | 11990na | | |
| 1700-1800 vl | Canada, CBC N Quebec Sce | 9625do | | | | 1800-1900 | Liberia, Radio ELWA | 4760do | | |
| 1700-1800 | Canada, CFCX Montreal | 6070do | | | | 1800-1900 | Netherlands, Radio | 6020af | 9605af | 11655af |
| 1700-1800 | Canada, CFVP Calgary | 6030do | | | | 1800-1849 mtwhf | New Zealand, R NZ Intl | 9655pa | | |
| 1700-1800 | Canada, CHNX Halifax | 6130do | | | | 1800-1850 | North Korea, R Pyongyang | 9640as | 13750as | |
| 1700-1800 | Canada, CKZN St John's | 6160do | | | | 1800-1830 s | Norway, Radio Norway Intl | 7120eu | 11930af | |
| 1700-1800 | Canada, CKZU Vancouver | 6160do | | | | 1800-1900 | Russia, Radio Moscow Intl | 6120eu | 7260na | 9880eu |
| 1700-1800 | China, China Radio Intl | 7405af | 9570af | 11575af | | | | 11745as | 12015as | 12050na |
| 1700-1800 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | | | | 15180na | 15190na | 15400na |
| 1700-1800 | Ecuador, HC | 6080do | 15350eu | 21455eu | | 1800-1900 | Swaziland, Trans World R | 3200af | | |
| 1700-1800 | Egypt, Radio Cairo | 15255af | | | | 1800-1845 | Swaziland, Trans World R | 9500af | | |
| 1700-1800 vl | Eqt Guinea, Radio Africa | 7200af | | | | 1800-1900 | United Kingdom, BBC London | 3255af | 5975as | 6005af |
| 1700-1800 | Iraq, Radio Iraq Intl | 15250as | | | | | | 6190af | 6195eu | 7110as |
| 1700-1800 vl | Italy, IRRS Milan | 7125eu | | | | | | 9630af | 9740me | 11940af |
| 1700-1800 | Japan, NHK/Radio | 6150na | 9535na | 9580as | 11930as | | | | 15070af | 15420af |
| 1700-1713 mtwhfa | Lebanon, Voice of | 6550eu | | | | 1800-1900 | USA, KAIJ Dallas TX | 15725am | | |
| 1700-1800 | Liberia, Radio ELWA | 4760do | | | | 1800-1900 vl | USA, KJES Mesquite NM | 15385na | | |
| 1700-1800 mtwhf | New Zealand, R NZ Intl | 9655pa | | | | 1800-1900 | USA, KTBN Salt Lk City UT | 15590am | | |
| 1700-1750 | North Korea, R Pyongyang | 9640af | 9977af | 13785af | | 1800-1900 | USA, KWHR Naalehu HI | 13625as | | |
| 1700-1750 | Pakistan, Radio | 7485eu | 11570eu | | | 1800-1900 | USA, Monitor Radio Intl | 9355pa | 13770me | 15665eu |
| 1700-1755 | Poland, Polish R Warsaw | 7285eu | 9525eu | | | 1800-1900 | USA, VOA Washington DC | 4985af | 6040eu | 9700eu |
| 1700-1800 | Russia, Radio Moscow Intl | 6120eu | 6970eu | 9505na | 9510eu | | | | 12040af | 13680af |
| | | 9560eu | 9880na | 11715af | 11745eu | | | | 11920af | 13710af |
| | | 11840na | 11960af | 12050af | 15105na | | | | 17800af | 17895af |
| | | 15180na | 15190na | 15425eu | 15580na | | | | | |
| | | 17760eu | 17875as | | | 1800-1900 | USA, WEWN Birmingham AL | 13615na | 15695eu | 18930sa |
| 1700-1800 | S Africa, Channel Africa | 4945af | | | | 1800-1900 | USA, WHRI Noblesville IN | 9485am | 13760am | |
| 1700-1800 | Slovakia, AWR Europe | 13595as | 15625as | | | 1800-1900 | USA, WINB Red Lion PA | 15715eu | | |
| 1700-1730 | Sri Lanka, SLBC Colombo | 6075as | 9720as | 15425as | | 1800-1900 | USA, WJCR Upton KY | 7490na | 13595na | |
| 1700-1715 | Swaziland, Trans World R | 7120af | | | | 1800-1900 | USA, WMLK Bethel PA | 9465eu | | |
| 1700-1730 | Switzerland, Swiss R Intl | 9885af | 13635me | 15635af | | 1800-1900 | USA, WRNO New Orleans LA | 15420am | | |
| 1700-1800 | United Kingdom, BBC London | 3255af | 3915as | 5975as | 6180eu | 1800-1900 | USA, WWCR Nashville TN | 13845am | 15685am | 17525am |
| | | 6190af | 6195eu | 7160me | 9410eu | 1800-1945 | USA, WYFR Okeechobee FL | 21500eu | | |
| | | 9515na | 9630af | 9740as | 11750as | 1800-1900 | Yemen, Yemeni Rep Radio | 9780do | | |
| | | 11940af | 12095af | 15070af | 15260af | 1815-1845 | Bangladesh, Radio | 7190eu | 9688eu | |
| | | 15400af | 15420af | 17880af | | 1830-1900 | Netherlands, Radio | 6015af | 6020af | 9605af |
| | | | | | | | | 9895af | 15315af | 17605af |
| 1700-1800 | USA, KAIJ Dallas TX | 15725am | | | | 1830-1845 | Rwanda, Radio | 6055do | | |
| 1700-1800 | USA, KTBN Salt Lk City UT | 15590am | | | | 1840-1850 mtwhfa | Greece, Voice of | 15630af | 15650af | 17525af |
| 1700-1800 | USA, KWHR Naalehu HI | 7425as | | | | 1845-1900 irreg s | Mali, RDTV Malienne | 4783do | 4835do | 5995do |
| 1700-1800 | USA, Monitor Radio Intl | 13625af | 21640af | | | 1850-1900 | New Zealand, R NZ Intl | 11735pa | | |
| 1700-1800 | USA, VOA Washington DC | 6040eu | 6110as | 7125as | 7215as | | | | | |
| | | 9645as | 9700eu | 9760af | 11920af | | | | | |
| | | 12040af | 13710af | 15205as | 15395as | | | | | |
| | | 15410af | 15445af | 17895af | | | | | | |
| 1700-1800 | USA, WCSN Scotts Cor ME | 15665eu | | | | | | | | |
| 1700-1800 | USA, WEWN Birmingham AL | 13615na | 15695eu | | | | | | | |
| 1700-1800 vl | USA, WHRI Noblesville IN me | 15105am | | | | | | | | |
| 1700-1800 | USA, WINB Red Lion PA | 15715eu | | | | | | | | |
| 1700-1800 | USA, WJCR Upton KY | 7490na | 13595na | | | | | | | |
| 1700-1800 smtwhf | USA, WMLK Bethel PA | 9465eu | | | | | | | | |
| 1700-1800 | USA, WRNO New Orleans LA | 15420am | | | | | | | | |
| 1700-1800 | USA, WWCR Nashville TN | 17525am | | | | | | | | |
| 1700-1800 | USA, WYFR Okeechobee FL | 21500eu | | | | | | | | |
| 1715-1730 mtwhf | Swaziland, Trans World R | 7120af | | | | | | | | |
| 1720-1730 mtwhf | Estonia, Estonian Radio | 5925eu | | | | | | | | |
| 1730-1800 | Netherlands, Radio | 6020af | 9605af | 11655af | | | | | | |
| 1730-1800 | Romania, R Romania Intl | 11830af | 15340af | 15365af | 17805af | | | | | |
| 1730-1800 | Sweden, Radio | 6065eu | 9655af | 15390me | | | | | | |
| 1730-1800 | Vatican State, Vatican R | 11625af | 11625af | | | | | | | |
| 1745-1800 | Bangladesh, Radio | 7190eu | 9647eu | | | | | | | |
| 1745-1800 | India, All India Radio | 7412eu | 9650me | 9950me | 11620eu | | | | | |
| | | 11935af | 15075af | | | | | | | |

1800 UTC

| | | | | | |
|--------------|---------------------------|---------|--------|---------|--------|
| 1800-1900 | Australia, Radio | 6060pa | 6080pa | 9580pa | 9860pa |
| 1800-1900 vl | Australia, VL8A Alice Spg | 2310do | | | |
| 1800-1900 vl | Australia, VL8T Tent Crk | 2325do | | | |
| 1800-1900 | Bahrain, Radio | 6010do | | | |
| 1800-1900 | Brazil, Radiobras | 15268eu | | | |
| 1800-1900 | Canada, CFCX Montreal | 6005do | | | |
| 1800-1900 | Canada, CFRX Toronto | 6070do | | | |
| 1800-1900 | Canada, CFVP Calgary | 6030do | | | |
| 1800-1900 | Canada, CHNX Halifax | 6130do | | | |
| 1800-1900 | Canada, CKZN St John's | 6160do | | | |
| 1800-1900 | Canada, CKZU Vancouver | 6160do | | | |
| 1800-1900 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | |
| 1800-1827 | Czech Rep, Radio Prague | 5930eu | 7345eu | 11640eu | |

HAUSER'S HIGHLIGHTS: SOUTH AFRICA

Channel Africa's winter English language schedule:

| | |
|-----------|-------------|
| 0300-0500 | 9585, 5955 |
| 0500-0600 | 7185, 11900 |
| 1000-1100 | 17810 |
| 1100-1200 | 9730 |
| 1500-1800 | 7225 |
| 1600-1700 | 15240 |

(SENTECH via Bill Westenhaver; last one is good here - Hanlon, PA)

Domestic SW: R. Oranje

| | |
|-----------|------|
| 1555-0450 | 3230 |
| 0455-1550 | 7270 |

Afrikaans Stereo

| | |
|-----------------------|------|
| 1600-2300 & 0300-0455 | 4810 |
| 0500-1555 | 7285 |

Radio 2000

| | |
|--------------------------------|------|
| 2300-0300 | 4810 |
| (SENTECH via Bill Westenhaver) | |

1900 UTC

2:00 PM EST/11:00 PM PST

SHORTWAVE

2000 UTC

3:00 PM EST/12:00 PM PST

FREQUENCIES

| | | | | | | | | | |
|------------------|---|------------|---------|---------|---------|------------------|--|---------|-------------------------|
| 1900-1927 | Albania, R Tirana Intl | 7260eu | 9730eu | | | 2000-2100 | Bahrain, Radio | 6010do | |
| 1900-2000 | Australia, Radio | 6060pa | 6080pa | 6150as | 7240pa | 2000-2100 | Bulgaria, Radio | 9700eu | 11720eu |
| | | 7260as | 9560as | 9580pa | 9860pa | 2000-2100 | Canada, CFCX Montreal | 6005do | |
| | | 11660pa | 11695pa | 11880pa | | 2000-2100 | Canada, CFRX Toronto | 6070do | |
| 1900-2000 vl | Australia, VL8A Alice Spg | 2310do | | | | 2000-2100 | Canada, CFVP Calgary | 6030do | |
| 1900-2000 vl | Australia, VL8K Katherine | 2485do | | | | 2000-2100 | Canada, CHNX Halifax | 6130do | |
| 1700-1800 | Canada, CFCX Montreal | 6070do | | | | 2000-2100 | Canada, CKZN St John's | 6160do | |
| 1700-1800 | Canada, CFVP Calgary | 6030do | | | | 2000-2100 | Canada, CKZU Vancouver | 6160do | |
| 1700-1800 | Canada, CHNX Halifax | 6130do | | | | 2000-2100 | China, ChinaRadio Intl | 9440af | 9920eu 11500eu 11715af |
| 1900-2000 | Canada, CKZN St John's | 6160do | | | | | | 15110af | |
| 1900-2000 | Canada, CKZU Vancouver | 6160do | | | | 2000-2100 | Costa Rica, R Peace Intl | 7385am | 9400am 15030am 21465am |
| 1900-2000 | China, China | Radio Intl | 9440af | 11515af | | 2000-2100 | Ecuador, HCJB Quito | 6080do | 21455eu |
| 1900-2000 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | 15350eu | 2000-2100 vl | Eqt Guinea, Radio Africa | 7200af | |
| 1900-2000 | Ecuador, HCJB Quito | 6080do | 15350eu | | | 2000-2050 | Germany, Deutsche Welle | 5960eu | 7285eu |
| 1900-2000 vl | Eqt Guinea, Radio Africa | 7200af | | | | 2000-2030 | Ghana, GBC Radio 1 | 4915do | |
| 1900-1950 | Germany, Deutsche Welle | 7110af | 9665af | 9765af | 11785af | 2000-2030 | Ghana, GBC Radio 2 | 3366do | |
| | | 11810af | 11865af | 13790af | 15145af | 2000-2100 | Hungary, Radio Budapest | 3955eu | 6110eu 7220eu |
| 1900-1910 mtwhfa | Greece, Voice of India, All India Radio | 7450eu | 9380eu | | | 2000-2100 | India, All India Radio | 7412eu | 9910au 9950eu 11620eu |
| 1900-1945 | | 7412eu | 9650me | 9950me | 11620eu | 2000-2030 | Indonesia, Voice of Israel, Kol Israel | 9675as | 11752as |
| | | 11935af | 15075af | | | | | 7405na | 7465na 9435eu 11603na |
| 1900-2000 vl | Italy, IRRS Milan | 7125eu | | | | 2000-2100 vl | Italy, IRRS Milan | 7125eu | |
| 1900-2000 | Japan, NHK/Radio | 6150as | 7140au | 9535as | 9580au | 2000-2010 mtwhf | Kenya, Kenya BC Corp | 4935do | |
| | | 9680as | | | | 2000-2100 | Kuwait, Radio | 11990eu | |
| 1900-2000 | Kuwait, Radio | 11990eu | | | | 2000-2100 | Liberia, Radio ELWA | 4760do | |
| 1900-2000 | Liberia, Radio ELWA | 4760do | | | | 2000-2010 | Mongolia, R Ulaanbaatar | 11790eu | 11850eu |
| 1900-1925 | Netherlands, Radio | 6015af | 6020af | 9605af | 9860af | 2000-2025 | Netherlands, Radio | 6020af | 9605af 9860af 9895af |
| 1900-2000 | New Zealand, R NZ Intl | 11735pa | | | | 2000-2050 | New Zealand, R NZ Intl | 11735pa | |
| 1900-2000 | Nigeria, Radio | 3326do | 4770do | 4990do | | 2000-2100 | Nigeria, Radio | 3326do | 4770do 4990do |
| 1900-2000 | Nigeria, Voice of | 7255af | | | | 2000-2100 | Nigeria, Voice of | 7255af | |
| 1900-1930 s | Norway, Radio Norway Intl | 5960eu | 7215pa | 9590af | | 2000-2100 | North Korea, R Pyongyang | 6576eu | 9345eu 9977eu |
| 1900-2000 vl | Papua New Guinea, NBC | 4890do | | | | 2000-2100 vl | Papua New Guinea, NBC | 4890do | |
| 1900-1955 | Poland, Polish R Warsaw | 5995eu | 7270eu | 7285eu | | 2000-2100 | Russia, Radio Moscow Intl | 7260eu | 9620na 9665na 9685na |
| 1900-1930 mtwhf | Portugal, Radio | 9780eu | 9815eu | 11975af | 17680af | | | 9750eu | 9880na 9895na 11630eu |
| 1900-2000 | Romania, R Romania Intl | 9690eu | 9750eu | 11810eu | 11940eu | | | 11675na | 11715eu 11730as 11750na |
| 1900-2000 | Russia, Radio Moscow Intl | 6120eu | 7170na | 7260eu | 9685eu | | | 12050na | 13665as 15425eu 15580na |
| | 11745eu 12050eu | 13636eu | 15105af | 15180eu | 15425na | | | 17605na | |
| 1900-1915 | Rwanda, Radio | 15580af | 17560af | 17605eu | 17760eu | 17875af | Slovakia, AWR Europe | 6055as | |
| 1900-2000 | Slovakia, AWR Europe | 6055af | | | | 2000-2100 vl | Solomon Islands, SIBC | 5020do | 9545do |
| 1900-2000 | Spain, R Exterior Espana | 15625as | | | | 2000-2100 | Sri Lanka, SLBC Colombo | 9720eu | 15120eu |
| 1900-2000 | Swaziland, Trans World R | 11775af | | | | 2000-2045 s | Swaziland, Trans World R | 3240af | |
| 1900-2000 | Thailand, Radio | 3200af | 3240af | | | 2000-2015 | Swaziland, Trans World R | 3200af | |
| 1900-2000 vl | Uganda, Radio | 4830do | 9655eu | 9700eu | 11905eu | 2000-2030 | Switzerland, Swiss R Intl | 3985eu | 6135af 6165eu 9770af |
| 1900-2000 | United Kingdom, BBC London | 4976do | | | | 2000-2100 vl | Uganda, Radio | 4976do | |
| | | 3255af | 6180eu | 6195eu | 7110as | 2000-2030 | United Kingdom, BBC London | 7160me | 9630af 9740me 17880af |
| | | 7160me | 9410eu | 9630af | 9740me | 2000-2100 | United Kingdom, BBC London | 7325eu | 9410eu 12095af 15070af |
| | | 11955as | 12095af | 15070af | 15400af | | | 15260sa | 15400af 17880af |
| 1900-2000 | USA, KAIJ Dallas TX | 15725am | | | | 2000-2100 | USA, KAIJ Dallas TX | 15725am | |
| 1900-2000 | USA, KTBN Salt Lk City UT | 15590am | | | | 2000-2100 vl | USA, KJES Mesquite NM | 15385na | |
| 1900-2000 as | USA, KVOH Los Angeles CA | 17775am | | | | 2000-2100 | USA, KTBN Salt Lk City UT | 15590am | |
| 1900-2000 | USA, KWHR Naalehu HI | 13625as | | | | 2000-2100 as | USA, KVOH Los Angeles CA | 17775am | |
| 1900-2000 | USA, Monitor Radio Intl | 13770me | 15665eu | 21640af | | 2000-2100 | USA, KWHR Naalehu HI | 11980as | 13770eu |
| 1900-1930 a | USA, Radio Miami Intl | 9955am | | | | 2000-2100 | USA, Monitor Radio Intl | 9355eu | |
| 1900-2000 | USA, VOA Washington DC | 3980eu | 6040eu | 7415af | 9525pa | 2000-2100 | USA, VOA Washington DC | 3980eu | 6040eu 7415af 9700eu |
| | | 9700af | 9760af | 11870as | 11920af | | | 9760af | 13710af 15205me 15410af |
| | | 12040af | 13710af | 15180pa | 15410af | | | 15445af | 15580af 17800af 21485af |
| 1900-2000 | USA, WEWN Birmingham AL | 15445af | 1580af | 17800af | | 2000-2100 | USA, WEWN Birmingham AL | 13615na | |
| 1900-2000 vl | USA, WHRI Noblesville IN | 13615na | 18930sa | | | 2000-2100 | USA, WHRI Noblesville IN | 9485am | 13760am |
| 1900-2000 | USA, WINB Red Lion PA | 9485am | 9590am | 13760am | | 2000-2100 | USA, WINB Red Lion PA | 15715eu | |
| 1900-2000 | USA, WJCR Upton KY | 15715eu | | | | 2000-2100 | USA, WJCR Upton KY | 7490na | 13595na |
| 1900-2000 | USA, WMLK Bethel PA | 9465eu | | | | 2000-2100 | USA, WMLK Bethel PA | 9465eu | |
| 1900-2000 | USA, WRNO New Orleans LA | 15420am | | | | 2000-2100 | USA, WRNO New Orleans LA | 15420am | |
| 1900-2000 | USA, WWCR Nashville TN | 13845am | 15685am | 17525am | | 2000-2100 | USA, WWCR Nashville TN | 13845am | 15685am 17525eu |
| 1900-2000 | USA, WYFR Okeechobee FL | 15355eu | 21615af | | | 2000-2045 | USA, WYFR Okeechobee FL | 17612af | 21615eu |
| 1910-1920 | Botswana, Radio | 3356af | 4830af | 7255af | | 2000-2030 | Vatican State, Vatican R | 15355eu | |
| 1930-2000 | Austria, R Austria Intl | 5945eu | 6155eu | 9880me | 13730af | 2000-2010 | Vatican State, Vatican R | 7355af | 9645af 11625af |
| 1930-2000 | Iran, VOIRi Tehran | 9022me | 9745me | | | 2000-2100 | Vatican State, Vatican R | 3950eu | 5882eu |
| 1930-2000 | Netherlands, Radio | 6020af | 9605af | 9860af | 9895af | 2010-2100 sa | Syria, Radio Damascus | 12085eu | 15095na |
| | | 11655af | 15315af | 17605af | | 2015-2045 s | Kenya, Kenya BC Corp | 4935do | |
| | | | | | | 2025-2045 | Swaziland, Trans World R | 3200af | |
| 1930-2000 | Serbia, Radio Yugoslavia | 6100eu | 9720af | | | 2025-2045 | Italy, RAI Rome | 7235me | 9710me 11800me |
| 1930-2000 | Slovakia, R Slovakia Intl | 5915eu | 7345eu | 9440eu | | 2030-2100 | Canada, RCI Montreal | 5995eu | 7235eu 13650eu 13670me |
| 1930-2000 s | USA, Radio Miami Intl | 9955am | | | | 2030-2100 | Egypt, Radio Cairo | 15315af | 15325me 17820me 17875af |
| 1935-1955 | Italy, RAI Rome | 7275eu | 9575eu | | | 2030-2100 | Netherlands, Radio | 9860af | 9895af |
| 1940-2000 | Mongolia, R Ulaanbaatar | 15345eu | | | | 2030-2100 mtwhfa | Palau, KHBV Voice of Hope | 11980as | |
| 2000-2100 | Australia, Radio | 6060pa | 6080pa | 6150pa | 7260as | 2030-2100 | Serbia, Radio Yugoslavia | 9580eu | 9620eu 11870eu |
| | | 9580pa | 9860pa | 11660pa | 11695pa | 2030-2045 | South Korea, R Korea Intl | 5975eu | 9640eu 9870eu |
| 2000-2100 vl | Australia, VL8A Alice Spg | 2310do | | | | 2030-2100 | Sweden, Radio | 6065af | 9655me |
| 2000-2100 vl | Australia, VL8K Katherine | 2485do | | | | 2030-2100 | Thailand, Radio | 4830do | 9655eu 9700eu 11905eu |
| 2000-2100 vl | Australia, VL8T Tent Crk | 2325do | | | | 2050-2100 | Vietnam, Voice of | 10059as | 12025as 15010as |
| | | | | | | 2051-2100 | Vatican State, Vatican R | 3950eu | 5882eu |
| | | | | | | | New Zealand, R NZ Intl | 15115pa | |

2000 UTC

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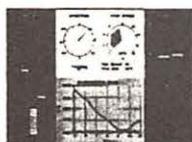
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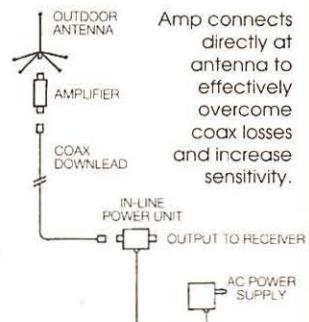
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| 2100-2200 | Australia, Radio | 6060pa 11855as | 6080pa 11880pa | 7240pa 11955pa | 7260as | 2200-2300 | Australia, Radio | 9580pa 11855as 15365pa | 9645as 11880pa 17795pa | 9660pa 11955pa 17860pa | 11695pa 13755as |
| 2100-2130 vl | Australia, VL8A Alice Spg | 2310do | | | | 2200-2300 vl | Australia, VL8A Alice Spg | 4835do | | | |
| 2100-2130 vl | Australia, VL8K Katherine | 2485do | | | | 2200-2300 vl | Australia, VL8K Katherine | 5025do | | | |
| 2100-2130 vl | Australia, VL8T Tent Crk | 2325do | | | | 2200-2300 vl | Australia, VL8T Tent Crk | 4910do | | | |
| 2100-2106 | Bahrain, Radio | 6010do | | | | 2200-2300 | Belgium, R Vlaanderen Int | 5910eu | 6035eu | | |
| 2100-2200 vl | Canada, CBC N Quebec Sce | 9625do | | | | 2200-2300 | Bulgaria, Radio | 9700eu | 11645eu | 11720na | |
| 2100-2200 | Canada, CFCX Montreal | 6005do | | | | 2200-2300 | Canada, CFCX Montreal | 6005do | | | |
| 2100-2200 | Canada, CFRX Toronto | 6070do | | | | 2200-2300 | Canada, CFRX Toronto | 6070do | | | |
| 2100-2200 | Canada, CFVP Calgary | 6030do | | | | 2200-2300 | Canada, CFVP Calgary | 6030do | | | |
| 2100-2200 | Canada, CHNX Halifax | 6130do | | | | 2200-2300 | Canada, CHNX Halifax | 6130do | | | |
| 2100-2200 | Canada, CKZN St John's | 6160do | | | | 2200-2300 | Canada, CKZN St John's | 6160do | | | |
| 2100-2200 | Canada, CKZU Vancouver | 6160do | | | | 2200-2300 | Canada, CKZU Vancouver | 6160do | | | |
| 2100-2130 | Canada, RCI Montreal | 5995eu 15325af | 7235eu 17820af | 13650me 17850af | 13670me 17875af | 2200-2230 | Canada, RCI Montreal | 11705as | 11845am | 11875am | 15305am |
| 2100-2200 | China, China Radio Intl | 9920eu | 11500eu | | | 2200-2300 | Canada, RCI Montreal | 5960na | 9755na | 13670am | |
| 2100-2130 | China, China Radio Intl | 11715af | 15110af | | | 2200-2230 | China, China Radio Intl | 3985eu | | | |
| 2100-2200 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | 21465am | 2200-2300 | China, China Radio Intl | 7170eu | | | |
| 2100-2200 | Cuba, Radio Havana Cuba | 15165eu | 17760eu | | | 2200-2300 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | |
| 2100-2127 | Czech Rep, Radio Prague | 5930eu | 7345eu | 9420eu | | 2200-2230 | Cuba, Radio Havana Cuba | 9550na | | | |
| 2100-2200 | Egypt, Radio Cairo | 15375af | | | | 2200-2227 | Czech Rep, Radio Prague | 5930eu | 7345eu | 9485eu | |
| 2100-2130 mt | Estonia, Estonian Radio | 5925eu | | | | 2200-2245 | Egypt, Radio Cairo | 9900eu | | | |
| 2100-2150 | Germany, Deutsche Welle | 6185as 9765as | 9615af 11785as | 9670as 13690as | 9690af 15425af | 2200-2300 vl | Eqt Guinea, Radio Africa | 15190af | | | |
| 2100-2200 | India, All India Radio | 7412eu 11715eu | 9910au 15225pa | 9950eu | 11620eu | 2200-2230 | Hungary, Radio Budapest | 3955eu | 6110eu | 7220eu | |
| 2100-2200 vl | Italy, IRRS Milan | 7125eu | | | | 2200-2230 | India, All India Radio | 7412eu | 9910au | 9950eu | 11620eu |
| 2100-2200 | Japan, NHK/Radio | 6035as | 6185as | 9625af | 9680af | 2200-2300 vl | Italy, IRRS Milan | 7125eu | | | |
| 2100-2115 | Japan, NHK/Radio | 9660as | 11915as | | | 2200-2225 | Italy, RAI Rome | 9710as | | | |
| 2100-2200 | Lebanon, Wings of Hope | 9960me | | | | 2200-2300 | Lebanon, Wings of Hope | 9960me | | | |
| 2100-2200 | Liberia, Radio ELWA | 4760do | | | | 2200-2300 vl | Malaysia, RTM Kota Kinabu | 5980do | | | |
| 2100-2125 | Netherlands, Radio | 9860af | 9895af | | | 2200-2300 | Malaysia, RTM Radio 4 | 7295do | | | |
| 2100-2200 | New Zealand, R NZ Intl | 15115pa | | | | 2200-2300 | New Zealand, R NZ Intl | 15115pa | | | |
| 2100-2200 | Nigeria, Radio | 7255af | | | | 2200-2300 | Nigeria, Radio | 3326do | 4770do | 4990do | |
| 2100-2200 mtwhfa | Palau, KHBN Voice of Hope | 11980as | | | | 2200-2300 | Nigeria, Voice of | 7255af | | | |
| 2100-2200 vl | Papua New Guinea, NBC | 4890do | 9675do | | | 2200-2300 vl | North Korea, R Pyongyang | 9325eu | 13185eu | | |
| 2100-2200 | Romania, R Romania Intl | 7225eu | 9690eu | 9750eu | 11940eu | 2200-2125 | Palau, KHBN Voice of Hope | 11980as | | | |
| 2100-2200 | Russia, Radio Moscow Intl | 7115eu | 7300eu | 9470eu | 9530af | 2200-2300 | Papua New Guinea, NBC | 9675do | | | |
| 2100-2200 | | 9640eu | 9655na | 9750eu | 9820eu | | Poland, Polish R Warsaw | 5995eu | 6135eu | 7285eu | |
| 2100-2200 | | 9880eu | 11730na | 11750na | 11770na | | Russia, Radio Moscow Intl | 9620na | 9665na | 9750na | 9880as |
| 2100-2200 | | 11920na | 13665eu | 15180na | 15425na | | | 11710as | 11730as | 11760as | 11790na |
| 2100-2200 | | 15580na | 16190na | 17675as | | | | 11920ca | 11960as | 12050na | 15290as |
| 2100-2130 | Serbia, Radio Yugoslavia | 7285eu | 9595eu | | | 2200-2215 vl | Sierra Leone, SLBS | 3316do | | | |
| 2100-2115 vl | Sierra Leone, SLBS | 3316do | | | | 2200-2300 | Slovakia, AWR Europe | 11610as | | | |
| 2100-2200 vl | Solomon Islands, SIBC | 5020do | 9545do | | | 2200-2235 vl | Solomon Islands, SIBC | 5020do | 9545do | | |
| 2100-2200 | South Korea, R Korea Intl | 6480eu | 15575eu | | | 2200-2210 | Syria, Radio Damascus | 5810eu | 9850eu | 11915eu | |
| 2100-2200 | Spain, R Exterior Espana | 6125eu | | | | 2200-2300 | UAE, Radio Abu Dhabi | 9605na | 9770na | 11885na | |
| 2100-2130 | Sri Lanka, SLBC Colombo | 9720eu | 15120eu | | | 2200-2300 | Ukraine, R Ukraine Intl | 4825eu | 6010eu | 6020eu | 6090eu |
| 2100-2105 | Syria, Radio Damascus | 12085eu | 15095na | | | 2200-2300 | | 7150eu | 7285eu | 9640eu | 11780eu |
| 2100-2200 | Turkey, Voice of | 9400eu | | | | | | 11950eu | 12030eu | | |
| 2100-2200 | United Kingdom, BBC London | 3255af 6180eu 9410eu | 3915as 6195eu 11955as | 5975na 7110as 12095af | 6005af 7325eu 15070eu | 2200-2300 | United Kingdom, BBC London | 3915as 7108as 9590na | 3955eu 7325eu 9915am | 5975na 9410eu 11695as | 6195eu 9570as 11750sa |
| 2100-2200 | | 15260sa | 15370as | 15400na | 15575eu | | | 11955as | 12095af | 15070eu | 15260sa |
| 2100-2200 | USA, KAIJ Dallas TX | 15725am | | | | 2200-2300 | USA, KAIJ Dallas TX | 15725am | | | |
| 2100-2200 | USA, KTBN Salt Lk City UT | 15590na | | | | 2200-2300 | USA, KTBN Salt Lk City UT | 15590am | | | |
| 2100-2200 s | USA, KVOH Los Angeles CA | 17775am | | | | 2200-2300 | USA, KWHR Naaehu HI | 17510as | | | |
| 2100-2200 | USA, KWHR Naaehu HI | 13720as | | | | 2200-2300 | USA, Monitor Radio Intl | 7510eu | 13625as | 15405as | 17555sa |
| 2100-2200 | USA, Monitor Radio Intl | 9355na | 13770eu | 13840pa | | 2200-2300 | USA, VOA Washington DC | 6035as | 7215as | 9705as | 9770as |
| 2100-2200 | USA, VOA Washington DC | 6040eu | 6125eu | 7415af | 9760eu | | | 11760as | 15185au | 15290as | 15305as |
| 2100-2200 | | 11870pa | 13710af | 15185pa | 15205me | | | 17735as | 17820as | | |
| 2100-2200 | | 15410af | 15445af | 15580af | 17735pa | 2200-2300 | USA, WEWN Birmingham AL | 13615na | | | |
| 2100-2200 | | 17800af | 21485af | | | 2200-2300 | USA, WHRI Noblesville IN | 9485am | 13760am | | |
| 2100-2200 | | 13615na | 18930sa | | | 2200-2300 | USA, WINB Red Lion PA | 15715eu | | | |
| 2100-2200 vl | USA, WHRI Noblesville IN | 13760am | | | | 2200-2300 | USA, WJCR Upton KY | 7490na | 13595na | | |
| 2100-2200 | USA, WINB Red Lion PA | 15715eu | | | | 2200-2300 | USA, WRNO New Orleans LA | 15420am | | | |
| 2100-2200 | USA, WJCR Upton KY | 7490na | 13595na | | | 2200-2300 vl | USA, WWCR Nashville TN | 12160am | 13845am | 15685am | |
| 2100-2200 | USA, WMLK Bethel PA | 9465na | | | | 2200-2245 | USA, WYFR Okeechobee FL | 17612af | 21525af | | |
| 2100-2200 | USA, WRNO New Orleans LA | 15420am | | | | 2200-2300 | Israel, Kol Israel | 7405na | 7465eu | 9435sa | 11603na |
| 2100-2200 | USA, WWCR Nashville TN | 13845am | 15610am | 15685am | | | | 15640sa | | | |
| 2100-2200 | USA, WYFR Okeechobee FL | 15566eu | 17512af | 21525af | | 2230-2300 | Sweden, Radio | 6065eu | | | |
| 2100-2145 | USA, WYFR Okeechobee FL | 21615eu | | | | 2230-2300 a | USA, Radio Miami Intl | 9955am | | | |
| 2110-2200 | Syria, Radio Damascus | 12085na | 15095na | | | 2240-2250 smtwhf | Greece, Voice of | 9425au | | | |
| 2115-2200 | Egypt, Radio Cairo | 9900eu | | | | 2245-2300 | Ghana, GBC Radio 1 | 4915do | | | |
| 2115-2210 mtwhf | United Kingdom, BBC Carib | 6110am | 15390am | 17715am | | 2245-2300 | Ghana, GBC Radio 2 | 3366do | | | |
| 2130-2200 | Australia, Radio | 9580pa 15365pa | 9645as 17860pa | 9660pa | 11695pa | 2245-2300 | India, All India Radio | 9705as | 9950as | 11745as | 15110as |
| 2130-2200 vl | Australia, VL8A Alice Spg | 4835do | | | | 2245-2300 mtwhf | USA, Voice of the OAS | 9670na | 11730na | 15155na | |
| 2130-2200 vl | Australia, VL8K Katherine | 5025do | | | | 2245-2300 | Vatican State, Vatican R | 6150as | 7305as | 9600au | 11880pa |
| 2130-2200 vl | Australia, VL8T Tent Crk | 4910do | | | | | | | | | |
| 2130-2200 as | Latvia, Radio | 5935eu | | | | | | | | | |
| 2130-2200 | Poland, Polish R Warsaw | 5955eu | 6135eu | 7285eu | | | | | | | |
| 2130-2200 | Sweden, Radio | 6065eu | | | | | | | | | |

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| 2300-0000 | Australia, Radio | 9580pa 9850as 15365pa | 9610as 11695as 17795pa | 9645as 11855as 17850pa | 9660pa 13755as | 2300-0000 | Russia, Radio Moscow Intl | 9620na 11750as 15425na 17890as | 9685na 12050na 12065na 15410as | 9750na 12065na 15410as 17610as | 11665as 15410as 17690na | |
| 2300-0000 vl | Australia, VL8A Alice Spg | 4835do | | | | 2300-2400 | Turkey, Voice of | 7185me | 9445na | 11710eu | | |
| 2300-0000 vl | Australia, VL8K Katherine | 5025do | | | | 2300-0000 | UAE, Radio Abu Dhabi | 9770na | 11885na | 13605na | | |
| 2300-0000 vl | Australia, VL8T Tent Crk | 4910do | | | | 2300-0000 | United Kingdom, BBC London | 5975na | 6175na | 6195eu | 9570as | |
| 2300-0000 vl | Canada, CBC N Quebec Sce | 9625do | | | | | | 9590na | 9915am | 11945as | 11955as | |
| 2300-0000 | Canada, CFCX Montreal | 6005do | | | | | | 15260sa | 15370as | | | |
| 2300-0000 | Canada, CFRX Toronto | 6070do | | | | 2300-0000 | USA, KAIJ Dallas TX | 13740am | | | | |
| 2300-0000 | Canada, CFVP Calgary | 6030do | | | | 2300-0000 | USA, KTBN Salt Lk City UT | 15590na | | | | |
| 2300-0000 | Canada, CHNX Halifax | 6130do | | | | 2300-0000 | USA, KWHR Naalehu HI | 17645as | | | | |
| 2300-0000 | Canada, CKZN St John's | 6160do | | | | 2300-0000 | USA, Monitor Radio Intl | 7510eu | 13625as | 15405as | 17555sa | |
| 2300-0000 | Canada, CKZU Vancouver | 6160do | | | | 2300-0000 | USA, VOA Washington DC | 6035as | 7215as | 9705as | 9770as | |
| 2300-0000 | Canada, RCI Montreal | 5960na | 9755na | 13670na | | 2300-0000 | USA, WEWN Birmingham AL | 9985eu | 11820sa | 13615na | | |
| 2300-0000 as | Canada, RCI Montreal | 11940am | 15235am | | | 2300-0000 vl | USA, WHRI Noblesville IN | 7315am | 9495am | | | |
| 2300-0000 | Costa Rica, R Peace Intl | 7385am | 9400am | 15030am | 21465am | 2300-0000 | USA, WINB Red Lion PA | 15715eu | | | | |
| 2300-0000 | Ecuador, HCJB Quito | 6080do | 21455eu | | | 2300-0000 | USA, WJCR Upton KY | 7490na | 13595na | | | |
| 2300-0000 | Egypt, Radio Cairo | 9900na | | | | 2300-2400 | USA, WRNO New Orleans LA | 15420am | | | | |
| 2300-0000 | Guam, KSDA/AWR Asia | 11980as | | | | 2300-0000 vl | USA, WWCR Nashville TN | 5810am | 13845am | 15685am | | |
| 2300-0000 | India, All India Radio | 9705as | 9950as | 11745as | 15145as | 2300-2345 s | Armenia, Radio Yerevan | 11790eu | 11960eu | | | |
| 2300-0000 vl | Italy, IRRS Milan | 17800as | | | | 2300-0000 | Austria, R Austria Intl | 9870sa | 13730sa | | | |
| 2300-0000 | Japan, NHK/Radio | 7125eu | 5965eu | 6185as | 9625as | 2300-0000 | Netherlands, Radio | 6020na | 6165na | | | |
| 2300-0000 | Lebanon, Wings of Hope | 9960me | 9680as | | | 2300-0000 m | Sri Lanka, SLBC Colombo | 15425na | | | | |
| 2300-0000 vl | Malaysia, RTM Kota Kinabu | 5980do | | | | 2300-0000 | Sweden, Radio | 11910as | | | | |
| 2300-0000 smtwha | Malaysia, RTM Radio 4 | 7295do | | | | 2300-0000 | USA, R Bosnia H via WHRI | 7315am | | | | |
| 2300-0000 | New Zealand, R NZ Intl | 15115pa | | | | 2300-0000 | Vietnam, Voice of | 10059as | 12025as | 15010as | | |
| 2300-2350 | North Korea, R Pyongyang | 11700na | 13650na | | | 2335-2345 smtwhf | Greece, Voice of | 9425sa | 11595sa | 11645sa | | |
| 2300-0000 mtwhfa | Palau, KHBN Voice of Hope | 11980as | | | | 2345-0000 | Bulgaria, Radio | 9700na | 11720na | | | |
| 2300-0000 vl | Papua New Guinea, NBC | 9675do | | | | | | | | | | |

SELECTED PROGRAMS

Sundays

2300 KTBN: Higher Dimensions. Carlton Pearson and the Higher Dimensions Choir.
 2310 Radio Japan: Hello from Tokyo. The weekend magazine program.
 2310 Voice of America (as): VOA Monday Morning. See S 0010.
 2330 BBC: Features. See S 1401.
 2330 KTBN: The Word for Today. Chuck Smith sermonizes from Calvary Chapel.
 2350 Radio Japan: Viewpoint. Opinions of a guest personality.

Mondays

2300 KTBN: Praise the Lord. See M 0500.
 2310 Voice of America (as): Newsline. See M 0110.
 2315 Radio Japan: Radio Japan Magazine Hour. The weekday magazine program.
 2330 BBC: Multitrack: Hit List. The UK Top 20.
 2330 Voice of America (as): VOA Tuesday Morning. See S 0010.
 2350 Radio Japan: Close Up. Featuring a Japanese person of note.

Tuesdays

2300 KTBN: Praise the Lord. See M 0500.
 2310 Voice of America (as): Newsline. See M 0110.
 2315 Radio Japan: Radio Japan Magazine Hour. See M 2315.
 2330 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
 2330 Voice of America (as): VOA Wednesday Morning. See S 0010.
 2350 Radio Japan: Close Up. See M 2350.

Wednesdays

2300 KTBN: Praise the Lord. See M 0500.
 2310 Voice of America (as): Newsline. See M 0110.
 2315 Radio Japan: Radio Japan Magazine Hour. See M 2315.
 2330 BBC: Multitrack: X-Press. New pop records, interviews, news and competitions.
 2330 Voice of America (as): VOA Thursday Morning. See S 0010.
 2350 Radio Japan: Close Up. See M 2350.

Thursdays

2300 KTBN: Praise the Lord. See M 0500.
 2310 Voice of America (as): Newsline. See M 0110.
 2315 Radio Japan: Radio Japan Magazine Hour. See M 2315.
 2330 BBC: Special Feature. Two Cheers for October (3rd). See W 1530.
 2330 BBC: Music Feature. Music, Mirth and Memories of Childhood (10th, 17th, 24th). See W 1530.

2330 Voice of America (as): VOA Friday Morning. See S 0010.
 2350 Radio Japan: Close Up. See M 2350.

Fridays

2300 KTBN: Praise the Lord. See M 0500.
 2310 Voice of America (as): Newsline. See M 0110.
 2315 Radio Japan: Radio Japan Magazine Hour. See M 2315.
 2330 BBC: Multitrack: Alternative. Latest developments on the British music scene.
 2330 Voice of America (as): VOA Saturday Morning. See S 0010.
 2350 Radio Japan: Close Up. See M 2350.

Saturdays

2300 KTBN: PowerPoint. Jack Graham provides the message.
 2310 Radio Japan: This Week. A weekly variety show.
 2310 Voice of America (as): VOA Sunday Morning. See S 0010.
 2330 BBC: Music Features. A Tapestry of Sounds (5th, 12th). Turkey's musical heritage. The Story of Western Music (19th, 26th). NEW. Tracing western music to the present day, featuring the Romantic period.
 2330 Radio Japan: The Week in Review. Looking back at the events that made the news last week.

HAUSER'S HIGHLIGHTS: NETHERLANDS

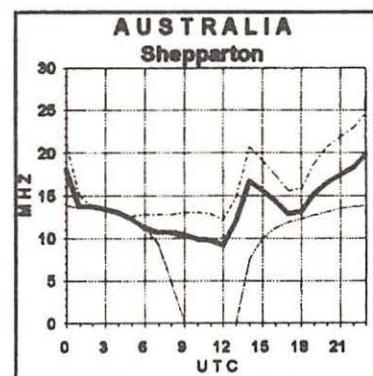
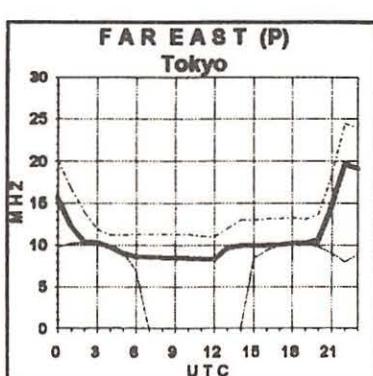
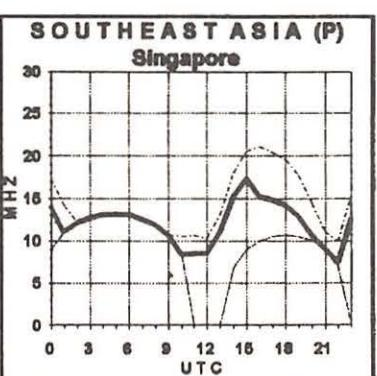
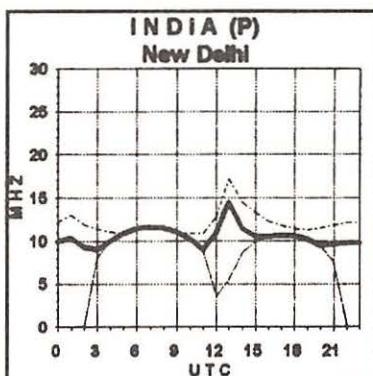
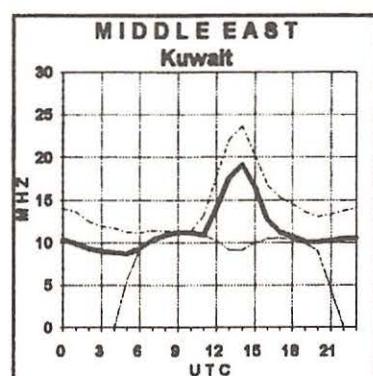
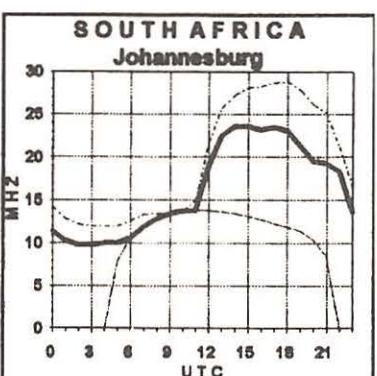
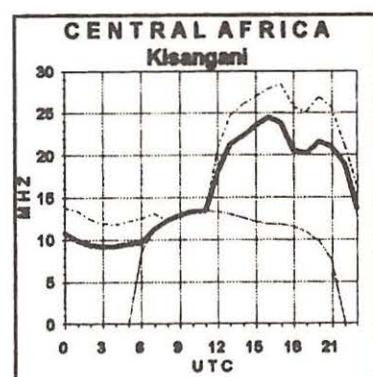
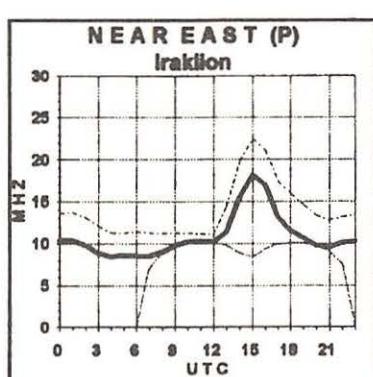
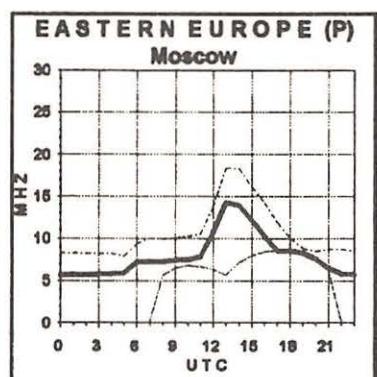
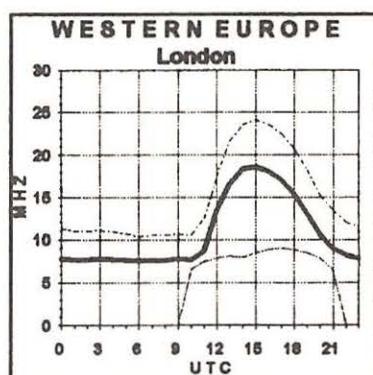
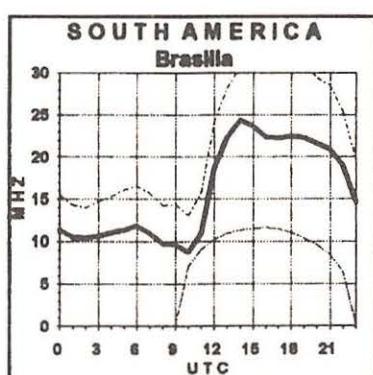
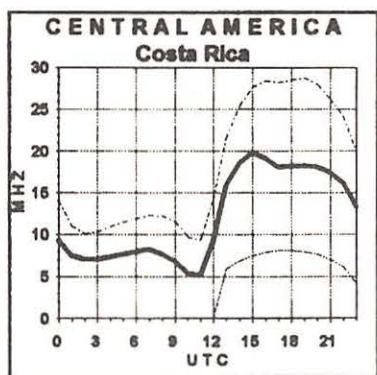
English to N. America has changed some frequencies for the winter:

Time UTC

| | |
|--|--|
| 2330 | 6020 & 6165 (both Bonaire - B) |
| 0030 | same plus Madagascar 11655 and 9840 |
| 0330 | 6015 & 6165-B |
| New broadcast to W. Africa | |
| 2030 | 9895 & 9860 from Flevo (F) |
| Other broadcasts: | |
| 0730 | 9720 & 11895-B |
| 0830 | 9720-B, 13700-Irkutsk. |
| 0930 | 9720-B, 9810 & 7260 from CIS, 21505-F except Sat. |
| 1030 | 9810, 7260 |
| 1130 & 1230 | 6045, 7130 |
| 1330, 1430, 1530 | 9895 & 15150-M |
| 1330 & 1430 | also 13700 |
| 1730 | 11655-F, 6020 & 9605-M |
| 1830 | 17605 & 15315-B, 9605 & 6020-M, 9895, 9860 & 6015-F |
| 1930 | 17605 & 15315-B, 9605 & 11655-M, 9895, 9860 & 6020-F |
| 2130 and 2230 | 1386-Kaliningrad |
| 0030 & 0130 | 7305, 5905 |
| 0130 & 0230 | 11655, 9860 |
| Spanish to Europe canceled, but still to Américas: | |
| 1130 & 1200 | 9715 & 6020-B, 2230 6020-F, 15315 & 11730-B |
| 2330 dropped | |
| 0230 | 6020-F, 6165 & 15315-B |
| 0430 | 6165 & 5995-B |
| (RNFM and Radio-Enlace via Mauer, Moats, Cline, Hecht) | |

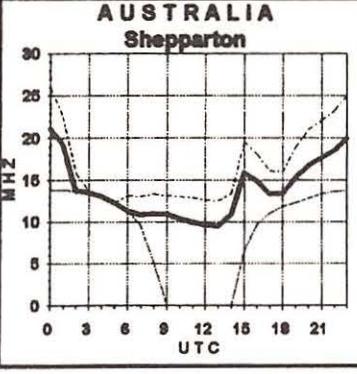
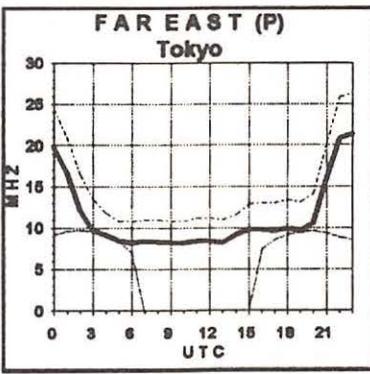
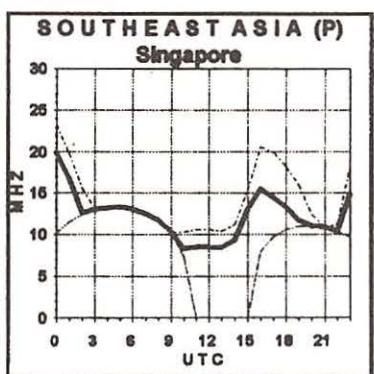
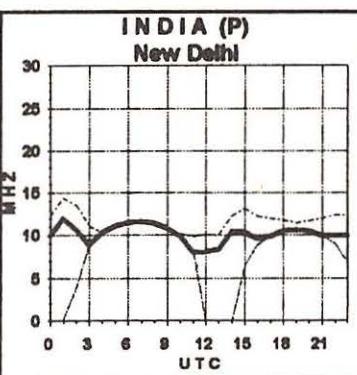
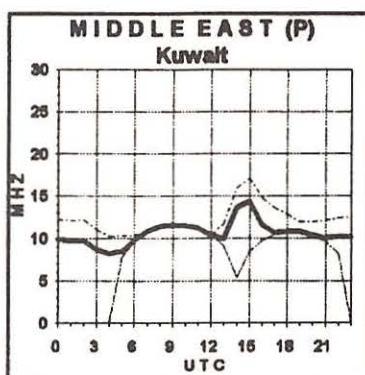
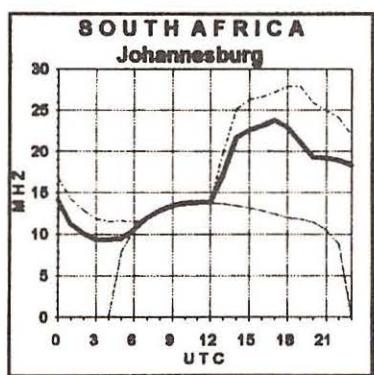
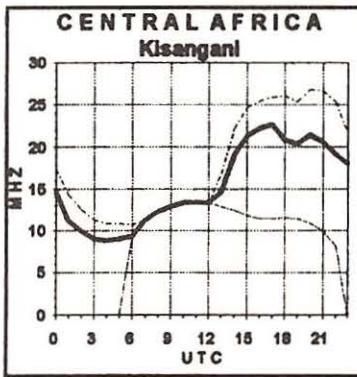
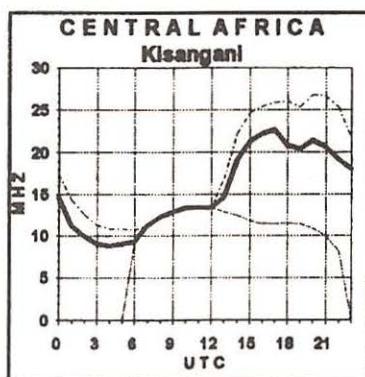
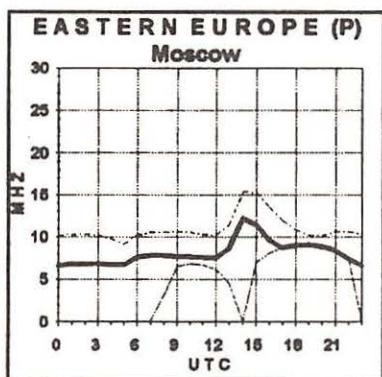
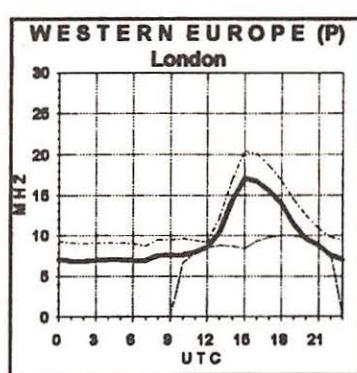
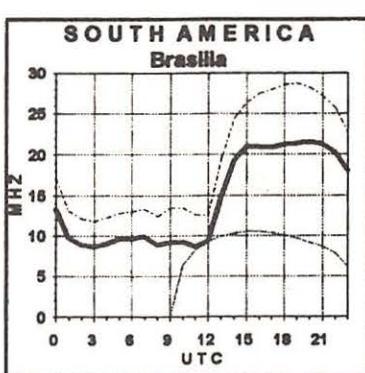
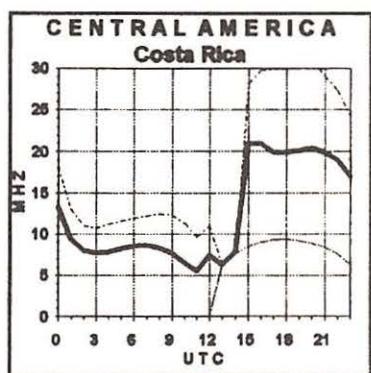
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

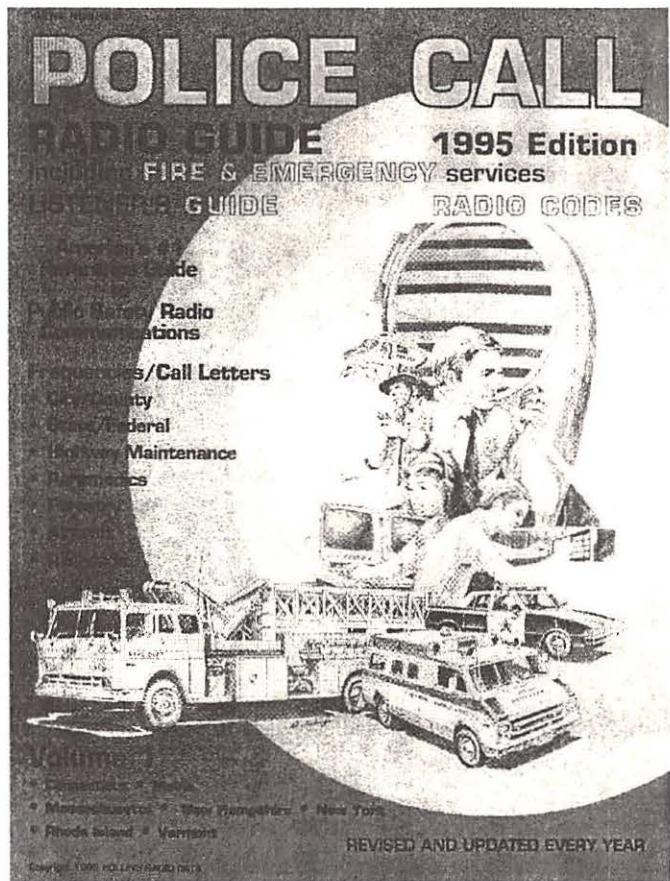


Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MU), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LU). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



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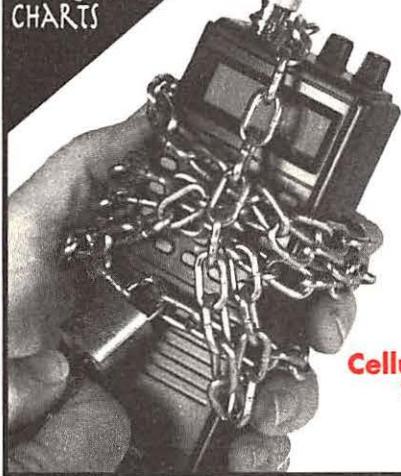
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DRAKE

In touch with the world.

1941 Hallicrafters Super Skyrider, SX-28

By Linton G. Robertson

This one probably brings back some fond memories among the readership! This old box certainly has a lot of class, and was, in 1941, THE premier general coverage receiver. With 15 tubes, a very solid steel chassis and a steel front panel 1/8 thick, this baby was 80 lbs. of very expensive fun. Even today, it can give a very good account of itself. I use it as the main SWL AM receiver in my shack every day of the year.

Frequency coverage is basically BCB to about 43 MHz, AM and CW only, although SSB is decodable by rolling back the RF gain and cranking up the AF to suit. The stability is something that does not come up to present day standards, but after a 40 minute warm up period the drift stabilizes enough to copy CW and SSB without having to touch up the tuning every few minutes. As a matter of fact, given a good warm-up the stability is + or - 500 Hz over an hour's time.

And talk about variable selectivity! The SX-28 has SIX selectivity positions, three tuned IF and three phased crystal positions that allow you to phase a 455 kHz crystal peak/notch all over the place. The crystal depth is, for a set this old, astoundingly deep; it's better than anything I've ever heard in a Hammarlund or other comparable make to date.

Other controls on the front panel are: Tone, Bass in/out, AF gain, RF gain, antenna trim, AVC on/off/BFO, receive/standby, crystal phasing (one of the few I've tried that actually works and works well, although aligning it can cause you to start drinking seriously), variable ANL, BFO pitch, main and bandspread tuning.

Opening up the top of the set one is confronted with a shield compartment around the RF/IF strip that looks like it could turn a .45 caliber bullet. The interior layout is very orderly and well-thought out, as is the underside of the chassis, a real mark of how much somebody up there in engineering cared about what they were doing.

The front panel color seems to vary depending on what particular run was done; I've seen 'em in gray and black. The one I restored has a nice, glossy black panel that has an engraved wrinkle pattern that simulates, well,



almost a fine leather! This is very nicely set off by arrows and the words "Super Skyrider" in red, and the words "Model SX-28, the Hallicrafters Inc, Chicago, USA" in white, as are the control legends on the front panel.

And the dial? Throw the switch, and man, that soft glow from the amber-colored dials is absolutely the last word.

The restoration of this set was probably one of the most ambitious projects I have ever undertaken. More than once during the process of this I stopped and asked myself if I had bitten off more than I could chew! It took three months; every spare moment was put into replacing all the wax caps, pounding out the dented cabinet, stripping, filling and re-plating corroded parts.

As the chassis on this set is of a design that does not lend itself easily to getting at those little, devilish capacitors and resistors down underneath the multi-section wafer switch assembly that runs the length of the unit, the entire wafer switch assembly had to be disassembled. Restoring a set like this is something I'd seriously think about before doing again. Maybe, some day, if stuck on a distant planet with nothing to do...

The audio on the SX-28 has been criticized from time to time for being narrow. Personally, I wonder what the reviewers have been listening with (their feet?), as the audio from THIS baby puts anything I've heard in the communications receiver category, solid state or tube, to absolute shame. Perhaps they weren't using a matching speaker, or didn't have the two 6V6/GT's properly plate-matched for good push-pull operation ... in any case, if you're interested in good AM audio, tune in a SWBC station in the clear, or an BCB AM station, and crank the selectivity

switch over to "BROAD IF", the tone to 11911, and the Bass to "TN", and I guarantee you'll hear every tweet, whistle, plunk and boom.

Overloading? You've got to be kidding! This thing has a front end that laughs at Deutsche Welle, sneers at HCJB, and chuckles merrily at WYFR. While the overall selectivity is not as good as today's sets, this is somewhat offset by the fact that the front end of the set seems virtually immune from overloading. Images are, for all practical purposes, non-existent. I think I may have heard the ghost of one once, up around 25 MHz, but that was it.

The main tuning knob has a lock-and-clutch assembly that lets you make darn sure that you don't go knocking your favorite DX station off the dial in an inadvertent swipe at the front panel while reaching for that DX-doughnut. Both main tuning and bandspread knobs look a bit like water valve handles, and really make the front panel distinctive.

The schematics say, "November, 1941," on them; just one month later, WWII began, and the SX-28 and the later SX-28A had a very successful run in the war. After the war, many amateurs coveted the sets, and hung on to them for decades. One older ham said to me, "Man, if you had one of these things, you were a very special person. You also had a lot of visitors to your shack!"

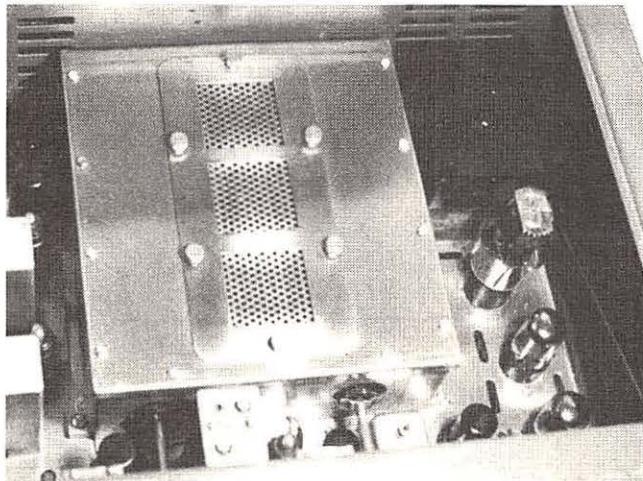
The tube complement is what you'd expect from a real room-heater like this (I like to keep my coffee warm on it):

| | | |
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| 1ST RF AMP: | | 6AB7* |
| 2ND RF: | | 6SK7 (all runs) |
| MIXER: | | 6SA7 |
| OSCILLATOR: | | 6SA7 |
| 1ST IF AMP & | | |
| NOISE LIMITER: | | 6L7 |
| 2ND IF AMP: | ..... | 6SK7 |
| DETECTOR AND S METER: | ..... | 6B8 |
| AVC AMP: | ..... | 6B8 |
| NOISE AMP: | ..... | 6SK7 |
| NOISE RECTIFIER: | ..... | 6H6 |
| BEAT OSC: | ..... | 6J5 |
| 1ST AUDIO AMP: | ..... | 6SC7 |
| AUDIO OUTPUT: | ..... | 6V6/GT (2) |
| RECTIFIER: | ..... | 5Z3 |

*on some runs a 6SK7...the AB7 was better!

If you see one of these fine old boxes at a swap meet, pick it up, especially if it comes with a matching speaker. You won't be sorry!

At right, a nostalgic look inside the cabinet of the Super Skyrider.

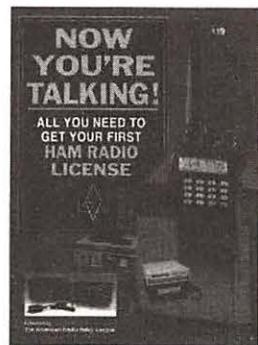


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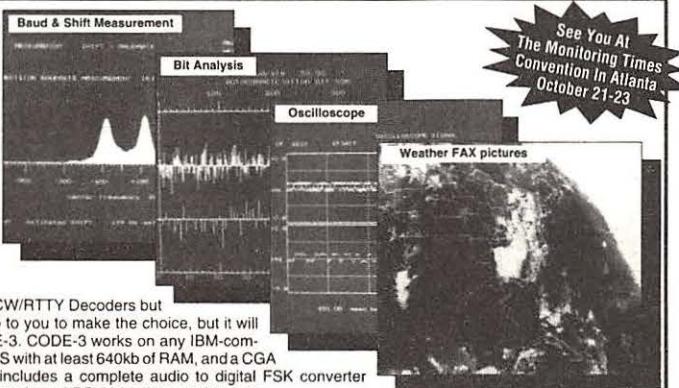


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- ARO-E/ARQ1000 Duplex
- ARQ-N-ARQ1000 Duplex Variant
- ARQ-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARO
- TDM242/ARQ-M2/4-242
- TDM342/ARQ-M2/4
- FEC-A FEC100A/FEC101
- FEC-S • FEC1000 Simplex
- Sports info 300 baud ASCII
- Hellscreiber - Sync/Asynch
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"Trap" Some Good DX

With the static levels low this time of year, AM DX should be nearing its peak. Listening during the "gray line" periods just before sunrise and just after sunset should bring in some great AM DX. Watch for times when the snow cover is deep—that makes for better AM propagation in the latitudes that have snow during the winter. It's no joke! Snow is a great reflector and it keeps your ground rods nice and damp, too.

However, you may be experiencing some disappointment if you live in a community that has one or more strong broadcast stations nearby. DXing can be a real problem when strong local signals mask what should be open channels. Strong signals can produce two arch enemies of the DXer: images and intermodulation.

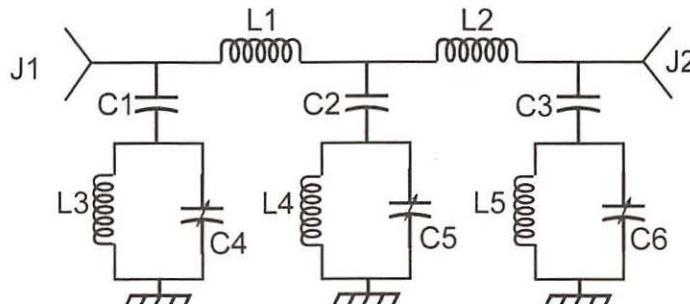
"Image" reception will cause a station to appear on a frequency offset from its transmission frequency by twice your radio's IF

For out-of-the ordinary opportunities to hear and identify distant broadcast stations, check out the DX Tests on page 117.

(intermediate frequency)—inevitably right in the middle of the band to which you want to listen. "Intermod" is the mixing of two or more strong signals to produce unwanted signals throughout your radio's range. For example, supposing you have two very strong stations spaced close together, such as 101.9 and 102.7. This pair is 800 kHz apart; so, every 800 kHz (.8 MHz), you might find one or the other appearing, although weaker than the original signal.

A very strong signal near the station you are trying to tune in can also reduce the sensitivity of your radio. The radio responds by decreasing its sensitivity in order to avoid overload and distortion.

All three of these problems are caused by the presence of very strong signals. All three can be greatly reduced by using a notch filter.



WAOWRI 3-Section Notch Filter

The Perfect Niche for a Notch

As DXers, we have always thought we should get as much signal as possible to the receiver. That is not always true, as too much signal can produce the unwanted side effects discussed above. Notch filters work by greatly reducing undesired signals without affecting other frequencies. They vary as to how much bandwidth they reduce and how deep the notch is. The deeper the notch, the more signal is eliminated.

Notch filters can be built in a variety of configurations, or they can be purchased. Notch filters require no power supply and can usually be tuned to reduce one or more frequencies. There are no expensive parts, and they can be made with very little investment in time or money.

The simplest FM notch filter is a bit broad, but very effective in removing intermod. This filter is commonly called a "stub." It is constructed by simply using a piece of 300-ohm TV twin-lead, cut to the length of 1/4 wave at the desired frequency. To figure this length, you simply take 468 and divide it by the frequency in megahertz. Then divide the answer by 2 and you have the length in feet.

Strip off enough insulation on one end to be able to twist and preferably solder the two leads together. Then, wrap the exposed wires in electrical tape. At the other end you expose a length of the two wires adequate to make connection to your receiver's

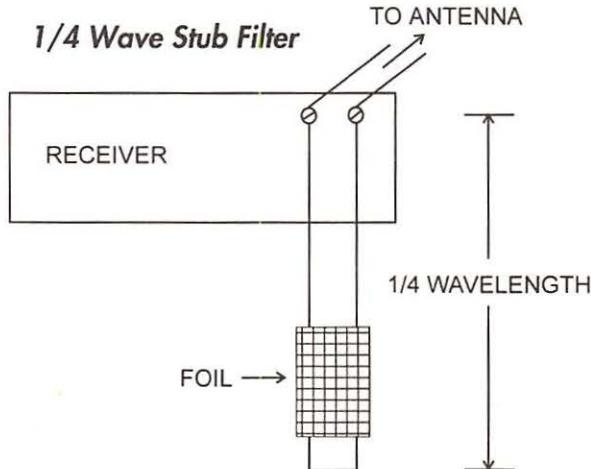
300-ohm antenna terminals. The stub will share those terminals with your antenna leads.

Taking a piece of aluminum foil about 4" wide, wrap the foil around the stub, like a sleeve. As you slide the foil up and down the stub, you will fine tune it to exactly where you wish the filter to be effective. This also works for TV DX as well. Many TV sets are prone to loss of sensitivity in strong FM RF fields as well as strong local TV signals.

A Three-Section Trap

I have designed a filter that is a bit more elaborate, but very effective in aiding DXing. This filter is a three section trap that allows each section to be individually tuned to the same or any other frequency. By tuning all three sections to one frequency, a single offending station can be made easier to live with. You can tune two sections to one station and the other to a second signal or all three to different stations. Depending on your location, and the power and frequency of the offending signals, the best combination of notches can be found.

There are a variety of parts that can be used to construct this circuit and a number of ways, too. I prefer to use air variable capacitors for C4, 5, and 6, although compression trimmers can be used. Although air variables are more expensive, they are easier to mount. Use of a



metal enclosure is required, obtainable at Radio Shack. The wire used is simply 18 gauge enameled or regular insulated wire. The coils are formed by wrapping the wire around a ballpoint pen. C1, 2, and 3 are ceramic disks.

The least expensive place to find air variable capacitors is at your local ham radio flea market. You can also check with Surplus Sales of Nebraska for this part. They are at 1502 Jones St, Omaha, NE 68102. (402) 346-4750.

Use the shortest leads possible when building your notch filter. Tuning is accomplished by adjusting one stage at a time, while listening to the frequency you want to hear. Simply adjust for maximum desired signal with a minimum of interference.

Another way to concentrate on a particular signal is to tune just off of the offending signal until the signal strength meter begins to fall. Adjust the filter until you get minimum deflection on the meter. Remember, you can tune one stage to one station and the next to another, or more than one to a single frequency.

You will be amazed at how well your reception improves with the assistance of a filter! If you enjoy engineering, you can play with the values in this circuit for notching strong local TV signals and other offending signals in the VHF region.

I am looking for good AM broadcast notch filter circuits. If you have a good, inexpensive circuit that can be easily built, send it in to share with your fellow DXers. I will try as many as possible and choose the best to be published in a later column.

Playing Fox and Hounds

If you are TV DXing or even just keeping

PARTS LIST

- C1,2,3 5 pF (anything from 3-10 pF okay)
Radio Shack #272-120
- C4,5,6 15-110 pF variable capacitor (can be anything reasonably close)
SSN#CAV-ZU100AS
- L1,2 Two turns #18 wire, 3/8" inside diameter, close spaced, Radio Shack #278-1217
- L3,4,5 Seven 1/2 turns #18 wire, 3/8" inside diameter, close spaced, same as above
- J1,2 Chassis mount type "F" connector
Radio Shack #278-212

*Suitable metal box to hold all components
Radio Shack #270-239
Knobs for variable capacitors Radio Shack #274-415*

Skipping In

Danny Oglethorpe of Shreveport, LA, got this TV DX!

CBFT 2 Montreal PQ
CKND 2 Minnedosa MB
KCWC 4 Landers WY
KVVU 5 Henderson NV

Norval Pagenhardt of Scotland, MD, sent in a wonderful tape of DX including these catches!

KSPZ 92.9 Glenwood Springs CO
"Oldies 92.9"
KGOR 99.9 Omaha NE "FM 100"
KQKQ 98.5 Council Bluffs, IA "Sweet 98"
KZEN 100.3 Central City, NE "KZ-100"
and many others from all over the central US.

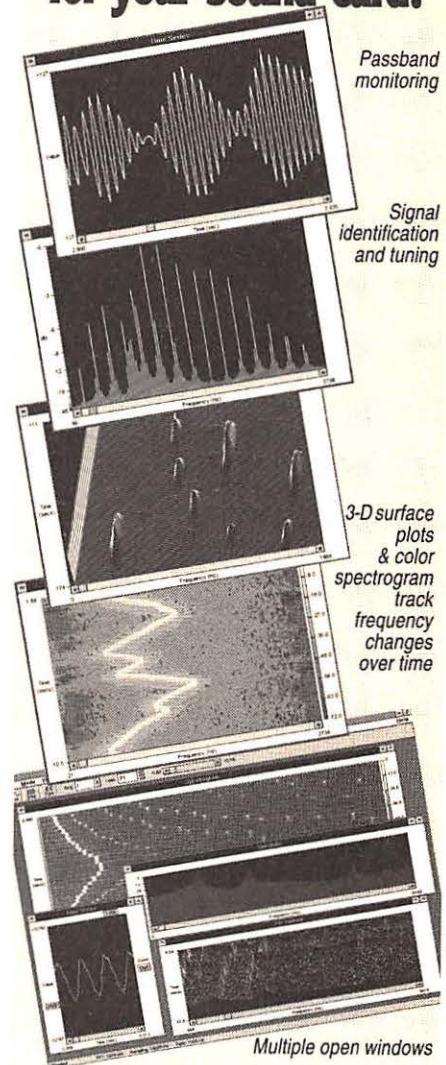
track of your local stations, you may feel a bit confused. The network affiliations in many cities are changing dramatically. While it was very rare in the past to see Fox network programming on anything but UHF stations, Fox is now appearing in major markets on low VHF channels. The other networks, long found only in major markets on VHF, are showing up on UHF, replacing Fox. A new network is soon to be launched by Paramount, to add to the confusion.

As the networks scramble to get the best possible affiliates, it will become more difficult for DXers to easily identify stations by their network programming. So, watch the ID very carefully and remember that these changes do not come gradually. In markets like Phoenix, as many as four stations can be affected by these network changes. Many of these stations changing affiliation may also change their ID logos and slogans, etc. This will be an exciting time to watch for changes in your local market and during DX openings.

Your Reports

Judging by the reports that are pouring in, this E-skip season has been very productive. I will mention a few this month and we'll pick up several more next month. If you have any DX to report, or other news of interest, I am available online via Prodigy at JPGC40A and the Internet at jpgc40a@prodigy.com. Thanks to those of you who have sent e-mail and regular mail reports so far. I really enjoyed Norval Pagenhardt's tape, as it included several stations that are close to my location. It was fun DXing via tape what are normally local signals. Let's hear from more readers of this column and share the DX!

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Strange Events in the Desert...

It has been nearly a year since we've discussed the super-secret Groom Lake complex, also known as Area 51, and "Dreamland." Recent movements in Congress to de-mothball the SR-71 Blackbird aircraft, more strange sightings, and efforts by the Air Force to increase the buffer zone have again brought the area into the news. The following background is based on material submitted to the column by reader Joe King of Reno, Nevada.

"Dreamland"—where fantasies are no more far-fetched than reality—is located in the northeast part of the Nellis Air Force Base Complex, a 3.5 million acre facility that stretches north from Las Vegas about 100 miles.

This complex was created when the Lockheed U-2 spy plane was developed in the early 1950's. It was rejuvenated for testing the U-2's replacement—the SR-71 Blackbird. The area reportedly houses a dozen Soviet MIG-21 and four MIG-23 fighter jets. It was the testing base for the F-117A prototype Stealth fighter and the B-2 Stealth Bomber.

There are several reported, but unknown aircraft docked there. It is the alleged base for the tear-shaped TR-3A "MANTA" tactical reconnaissance plane, which was used to fly support for the Stealth fighters in the Gulf War. It is also the alleged base for the delta-winged "AURORA," which can supposedly fly at approximately eight times the speed of sound. These projects are reportedly done under the master project SKUNKWORKS.

In 1984 the Air Force illegally seized 89,000 acres of land northeast of Groom Lake as a "buffer zone." No environmental impact statement was filed, but in 1987 Congress approved the seizure. Currently, the Air Force is seeking the closure of an additional 4000 acres around the range, which would completely stop any observation of the base.

Numerous television programs and published articles have covered the topic, and we will not go into a rehash of these here. For the newcomer to the subject, however, the Reno Nevada *Gazette-Journal* of Sunday, July 24, 1994, did one of the best reports I have ever seen.

What does this have to do with Federal Monitoring, you might ask? Well, this is a top

secret government installation which the government, for all practical purposes, will not admit exists. There have already been numerous photo essays on the area. What has not been done is a radio spectrum analysis of the area. An interesting project would be to take a spectrum analyzer to the area to document the radio emissions from the area.

If you should decide to undertake this ad-

mittedly risky project, be sure to keep a monitor radio on 496.250, 496.275, and 496.300 MHz. These are the frequencies used by the ground seismic sensors to alert the roving, heavily armed guards in the white vehicles, that you are in the area. See the insert for frequencies reported to be in use by both the ground and the airborne transmitters.

You never know what you might hear. Strange happenings, involving alien aircraft, have been reported in this area since the 1940's. Since the Freedom of Information Act was passed, information has continued to leak out of Washington, D.C., circles concerning the crash 80 miles outside of Roswell, New Mexico, in 1947 of a so-called "flying saucer." Supposedly one "alien," three feet tall with an I.Q. of 200 and an earth life expectancy of 375 years survived and has been living near the Nevada test site with two others brought in on an exchange basis.

Now there have been recent reports by Las Vegas news stations of strange sightings once again. The "flying saucers" reported over the years could be stages in the evolution of the AURORA aircraft, whose vapor trails have been seen in the vicinity of Groom Lake, Nevada; Atlanta, Georgia; and over northern Scotland. One monitor reported hearing a transmission of an unidentified and unseen aircraft in the Groom Lake area requesting a flight level of 680. That's 68,000 feet—higher than anything flies, that I know of!

If we, or "they," have anything flying out there, they still have to communicate. Follow the listed frequencies in Table 1 and then branch out in your tuning. Let us know what you hear.

Federal Level Security?

Back to earth, a reader who wishes to remain anonymous sent in the following:

During the World Cup Games in Chicago, the Chicago Police Department officers assigned to the detail inside Soldier Field used 6 channel VHF Motorola HT600 radios—Not too interesting by itself, but these frequencies had "DOD SPECIAL EVENTS" property decals on the back of the radios. The following *confirmed* frequency lineup is:

- Ch. 1—148.925
- Ch. 2—139.275
- Ch. 3—141.100
- Ch. 4—142.375

TABLE 1

Groom Lake Area Frequencies

DEVELOPMENT DIVISION (This oversees PROJECT SKUNKWORKS)

SECURITY

| | |
|---------|---|
| 142.200 | The most popular frequency to monitor. This is used by the roving guards in the white Jeeps |
| 141.550 | Backup channel |
| 409.025 | Possible base use |
| 167.700 | Reported, but use unknown |

PROJECT SKUNKWORKS—Aircraft liaison to control tower/ground

| | | | |
|---------|---------|---------|---------|
| 252.400 | 264.100 | 264.600 | 275.200 |
| 283.700 | 289.400 | 292.100 | 345.400 |
| 349.300 | 379.700 | 382.600 | 407.400 |
| 407.500 | | | |

The 407 MHz frequencies are narrow band FM and are used on the base flightline. All of the others are in the AM mode.

554th RANGE GROUP—GROOM LAKE

| | | | |
|---------|---------|---------|---------|
| 238.300 | 259.400 | 268.200 | 293.500 |
| 389.100 | | | |

SENIOR SMART PROJECT (formerly known as DREAMLAND)

| | | |
|---------|---------|---------|
| 253.400 | 255.800 | 392.100 |
|---------|---------|---------|

DARK STAR—The AWACS aircraft used at Groom Lake

| | |
|---------|---------|
| 376.200 | 391.800 |
|---------|---------|

GROUND INTRUSION SENSORS

| | | |
|---------|---------|---------|
| 496.250 | 496.275 | 496.300 |
|---------|---------|---------|

VIDEO SURVEILLANCE CAMERAS—

Monitor the perimeter of the area along with the ground sensors

210.010—Wide band video

The above frequencies are courtesy of:

Frequency Intelligence Directory by Jay Harris, 1995 edition—forthcoming.

Ch. 5—148.775
Ch. 6—140.325

All of the channels were simplex. Some radios had well-worn decals from a previous event, believed to have been in Buffalo, New York. The frequency of 140.200 was designated as the "JOINT OPERATIONS CENTER" net.

With the upcoming 1996 Olympics in Atlanta looming on the horizon, look for more of these Department of Defense frequencies to be in use at the Olympics.

Bureau of Land Management

This has been one of the most deadly summers in recorded history for the men and women of the Bureau of Land Management. This agency, a division of the Department of the Interior, is responsible for the total management of approximately 270 million acres of public lands and its resources, both above and below ground.

Some of the men and women of the Bureau of Land Management are assigned to the fire-fighting division. These are the smoke-jumpers and smoke-eaters who risk their lives to extinguish the forest fires in our national forests. This year over a dozen of these firefighters were killed when they were caught inside of a firestorm.

The Boise Interagency Fire Center is jointly managed by the U.S. Forest Service and the Bureau of Land Management. The most common radio frequencies used are listed in Table 2.

Following is a list of frequencies that have been active during the recent rash of forest and wildfires in Arizona, sent to us by John Moran of Tempe.

Phoenix Sky Harbor Frequencies:

ATIS—121.200
Clearance—118.100/269.200
Ground—121.900/121.850
Tower—R 8L/26R 118.700/385.400
Tower—R 8R/26L 120.900/254.300
Departure North/East Bound—119.200/
379.800
Departure West/South Bound—124.100/
269.600
Approach (Final)—126.600/393.100
Approach Northwest—128.650
Approach South—126.800/256.900
Approach—120.700/239.00
Approach—123.700/363.00

Albuquerque Center:

| | |
|-----------|-----------|
| 124.50 NE | 135.15 SW |
| 125.40 SE | 128.45 NW |
| 125.25 SW | 132.90 NE |

Agency of the Month: United States Attorney

| <u>Channel</u> | <u>Frequency</u> | <u>Use</u> |
|----------------|------------------|--|
| 01 | 416.1750 | RPTR OUT |
| | 415.8500 | CONTROL/ |
| | | MOBILE INPUT |
| | | OPERATIONS |
| 02 | 416.1750 | SIMPLEX |
| 03 | 410.8500 | TACTICAL |
| 04 | 410.0750 | TACTICAL |
| | | All the above use a private line tone of 156.7 Hz. |

The U.S. Attorney is the prosecutor for the federal government in all federal cases, both civil and criminal. Anywhere there is a federal court house, there will be an office of the U.S. Attorney. Their radio system is coming online nationwide. The frequency layout is as follows:

Well, that's it for this month. 73's—John WA4VPY

TABLE 2

| Boise Interagency Fire Center | | | | | |
|--|--------------|-------------------------|--------------------|------------------|------------|
| Nationwide Disaster System | | | | | |
| <u>CH.</u> | <u>USE</u> | <u>FREQUENCY / MODE</u> | <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> |
| C1 | COMMAND NET | 168.7000 SIMPLEX | 01 | 49.910 | CONT/MOB |
| C1 | COMMAND NET | 168.7000 RPTR OUT | | 49.810 | RPTR OUT |
| | | 170.9750 CONT/MOB | 02 | 49.810 | SIMPLEX |
| C2 | COMMAND NET | 168.1000 RPTR OUT | | | |
| | | 170.4500 CONT/MOB | | | |
| C2 | COMMAND NET | 168.1000 SIMPLEX | | | |
| C3 | COMMAND NET | 168.0750 RPTR OUT | | | |
| | | 170.4250 CONT/MOB | | | |
| C3 | COMMAND NET | 168.0750 SIMPLEX | | | |
| C4 | COMMAND NET | 169.8750 RPTR OUT | <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> |
| | | 172.2500 CONT/MOB | 01 | 167.0000 | SIMPLEX |
| C4 | COMMAND NET | 169.8750 SIMPLEX | 02 | 166.9750 | CONT/MOB |
| C5 | COMMAND NET | 169.1750 RPTR OUT | | 166.3750 | RPTR OUT |
| | | 171.5000 CONT/MOB | 03 | 167.0750 | CONT/MOB |
| C5 | COMMAND NET | 169.1750 SIMPLEX | 04 | 166.4875 | RPTR OUT |
| | | | 05 | 166.4875 | SIMPLEX |
| | | | 06 | 166.6750 | SIMPLEX |
| | | | 07 | 166.2625 | SIMPLEX |
| Division of Law Enforcement | | | | | |
| <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> | | | |
| 01 | 411.8750 | CONT/MOB | | | |
| | 417.3000 | RPTR OUT | | | |
| 02 | 411.8500 | CONT/MOB | | | |
| | 417.3500 | RPTR OUT | | | |
| 03 | 411.8750 | CONT/MOB | | | |
| | 417.5000 | RPTR OUT | | | |
| 04 | 411.9250 | CONT/MOB | | | |
| | 417.8000 | RPTR OUT | | | |
| Incident Command System | | | | | |
| <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> | | | |
| 01 | 411.8750 | CONT/MOB | | | |
| | 417.3000 | RPTR OUT | | | |
| 02 | 411.8500 | CONT/MOB | | | |
| | 417.3500 | RPTR OUT | | | |
| 03 | 411.8750 | CONT/MOB | | | |
| | 417.5000 | RPTR OUT | | | |
| 04 | 411.9250 | CONT/MOB | | | |
| | 417.8000 | RPTR OUT | | | |
| Logistics Operations | | | | | |
| <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> | | | |
| 01 | 41.270 | SIMPLEX | | | |
| | 41.550 | SIMPLEX | | | |
| 03 | 49.610 | RPTR OUT | | | |
| | 46.630 | CONT/MOB | | | |
| 04 | 49.770 | RPTR OUT | | | |
| | 46.810 | CONT/MOB | | | |
| 05 | 49.910 | RPTR OUT | | | |
| | 46.990 | CONT/MOB | | | |
| Division of Fire, Aviation and Safety | | | | | |
| <u>CHAN</u> | <u>FREQ.</u> | <u>USE</u> | | | |
| 01 | 170.0500 | CONT/MOB | | | |
| | 166.7250 | RPTR OUT | | | |
| 02 | 166.7750 | SIMPLEX | | | |
| 03 | 168.2500 | SIMPLEX | | | |
| 04 | 168.4000 | SIMPLEX | | | |
| 05 | 166.6125 | SIMPLEX | | | |
| 06 | 169.7500 | SIMPLEX | | | |
| 07 | 168.5500 | SIMPLEX | | | |
| 08 | 167.9500 | SIMPLEX | | | |
| 09 | 167.1000 | SIMPLEX | | | |
| 10 | 168.4750 | SIMPLEX | | | |
| Air Operations Channels | | | | | |
| | | | <u>AIR CONTACT</u> | <u>FREQUENCY</u> | |
| | | | AIR TACTICS 1 | 168.5500 | |
| | | | AIR TACTICS 2 | 166.6750 | |
| | | | AIR TACTICS 3 | 169.1500 | |
| | | | AIR TO GROUND | 167.9500 | |
| | | | AIR SAFETY | COMMON | 172.6000 |
| NOTE: All frequencies in MHz. | | | | | |
| Cont.—Control station | | | | | |
| Mob.—Mobile station or handheld transmit | | | | | |
| Rptr. out—Repeater out | | | | | |

Missing at Sea

On June 19 six persons left Basseterre, St. Kitts, for a morning of fishing. One of them was the St. Kitts ambassador to the Organization of American States. The six left in a 25 foot cuddy cabin, offshore day cruiser. They have not been seen since. No trace of that vessel has ever surfaced—no debris, no oil slick, nothing.

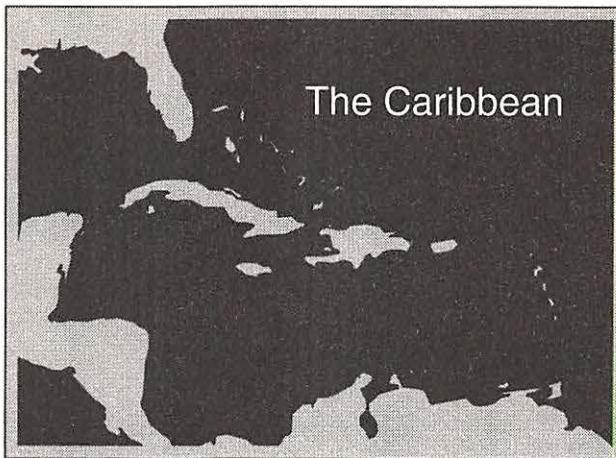
Our column this month follows the reasoning process and the information that go into a maritime search and rescue effort, which is very much like searching for a needle in a haystack. If you'll follow the story to the end, there may be a role in this for radio monitors, too.

The *Maxi II* carries two 150 horsepower outboard motors, and has a 125 gallon fuel capacity. She is 24 feet eight inches long with a maximum beam of eight feet. For a morning's fishing she is more than adequate and she is well suited for coastal trips. Given this information, one of the first things one would want to consider is, what is the total range of the boat? How far could it travel under power?

Marine engines generally consume approximately 0.1 gallon per hour per horse power. In the case of the *Maxi II* this would mean approximately 15 gallons per hour for each engine. Running with both engines, her fuel supply would last approximately 4 hours and 10 minutes. If one assumes that the vessel makes 20 knots, then her range would be approximately 83 nautical miles.

At this juncture, one must begin to model several scenarios based upon different assumptions. If her engines functioned, how far could she be expected to go? At what rate the *Maxi II* would drift if without power, and in which direction? Without knowing just how long the engines functioned, and precisely where the Maxi began to drift, one must do some guessing.

First let's tackle the wind. According to the Pilot Chart for the North Atlantic, during more than eighty per cent of the the month of June, the wind blows from the east or southeast at force 4. This would cause the vessel to drift to the west or northwest at a rate of approximately one and a half knots or less. The situation in July favours winds at force 4 from the east or northeast well over eighty percent of the time. In either month the wind



can be expected from the east sixty to seventy percent of the time.

A second force which can act upon the vessel are the ocean currents. The currents set slightly north of westerly at a rate of 0.7 knots. In July the currents set in the same general direction, but at 0.5 knots in the northern Lesser Antilles, and at 0.8 knots in the southern part of the Lesser Antilles.

Plotting a Course

Now we are ready to ask the question: where is the *Maxi II*? One has to assume that whatever happened to the vessel, her engines became disabled. If this were not the case she should have been able to get to some safe harbour. If her engines were sound but she lost her steering gear, the vessel could still be successfully steered by independently varying the speed of each engine. This is a common practice on twin screw (propeller) vessels which have lost the ability to steer.

From what point could she have started to drift? Good seamanship dictates that you leave a safety margin in case of problems. Usually one figures on one third of the fuel out, one third back, and one third in reserve. This would mean that the vessel could be up to about 28 miles from Basseterre. When she left Basseterre, the ocean current would reduce her westerly travel by up to a mile and add a mile to her easterly travel over the course of her hour and twenty minute or so outward trip. This assumes she travels at a cruising speed of twenty knots. If she travelled at a lesser rate of

speed, she would be further aided or impeded by the current, but her distance through the water would be increased by a small amount.

This puts a possible starting point anywhere from twenty seven miles west to twenty nine miles east of St. Kitts, and roughly twenty eight miles north or south of the island. The wind would not be a major factor, except to increase fuel consumption. Nonetheless, this adds up to over 400 square miles of ocean.

Had the vessel gone to the west of the island and encountered difficulty, she would likely have drifted back toward the island with the wind and current. If she were to miss the island, she would then carry in the same manner as though she had started from either the north or south side of the island.

Unpowered and Adrift

Now let's look at where she might drift. For the sake of discussion we'll assume that the vessel encountered difficulty either twenty miles north or south of St. Kitts. We will also assume that she encountered her problem at 10:00 AM on June 19th.

By midnight she would have drifted about thirty miles in a direction slightly north of west. At this point *Maxi II* would be clear of land and nowhere near any shipping lanes. By midnight of the 21st, she would have drifted another 104 miles. At this point the vessel would likely lie somewhere to the southeast of Puerto Rico and also the shipping lanes between the Panama Canal and Gibraltar. By midnight of the 22nd, she might have been just east of Puerto Rico and drifting either north or south of that island depending on from whence she started.

Around Puerto Rico the current slows down to half a knot north of the island and 0.6 knots south of the island. On the northerly route her drift would be about 48 miles and to the south it would be 50 miles in a westerly direction.

It is at this point that the argument for a drift along the northerly track begins to ap-

pear unlikely. By the end of July this course would have either brought the *Maxi II* ashore intact or she should have been found on the northern shores of Puerto Rico or Hispaniola. The island of Hispaniola is the home to both the Dominican Republic and Haiti. A drifting vessel would be likely to be found by the innumerable naval vessels enforcing the trade embargo on Haiti, especially if that vessel were on the northern side of the island.

It seems much more likely that *Maxi II*, if no trace has yet been found, would be on a more southerly track. By midnight of June 26th, she likely crossed the shipping lane which runs from the Panama Canal, passes between Puerto Rico and Hispaniola, and heads toward the English Channel. By the 29th, she could have been in the vicinity of the shipping lane which goes between Jamaica and the

Cape of Good Hope, south of the Dominican Republic.

By the beginning of August, the wind will usually be blowing from either the east or northeast at force 4. This would tend to carry the *Maxi II* on a more southerly track. As the vessel drifted toward Jamaica her track could take many turns, depending on exactly where she was. She could, in fact, have been drifting much more slowly than I have estimated here if the wind was less. In fact, the weather this summer has not been severe and *Maxi II*'s drift could have been much slower.

Looking for Clues

So what does this have to do with radio? *Maxi II* carried only a hand held VHF radio. This attests to the use to which the owners put her—short trips not far from shore. Its range would be limited and the batteries would have a short life. They would therefore use it sparingly, unless there was a method of using the vessel's power supply—something which is unusual for maritime VHF hand held radios.

In mid August a weak distress signal was in fact heard on VHF near Honduras. It is conceivable that the sender of that signal could have been someone aboard *Maxi II*. The signal was quite weak and came from a vessel which had been drifting in the Caribbean for several weeks. However, as this column is being written no further word has been heard, nor any wreckage found.

Since they would be better able to see a passing ship than vice versa, it is likely that this is the use to which the radio would be put. Unless the vessel drifts within a reasonable distance of the shore, it is unlikely that a blind distress call would be made for fear of running down the batteries.

Obviously, from North America, one can't expect to hear calls on VHF channels; however, there is traffic on HF and MF when searches are being conducted. Many vessels carry MF and HF equipment, and will be in communication with shore stations directing the search. These can provide interesting listening. Among the Caribbean stations worth monitoring are those listed in Table 1. While I have listed Port au Prince Radio, it is unknown whether or not the station is operational. Recent reports indicate the building still exists; however, there is no known operator.

Other maritime stations abound, especially in South and Central America

(Venezuela, Colombia, Panama, Costa Rica, Nicaragua, Honduras etc.) but I did not list them, because of their heavier load of routine and emergency traffic.

Why is it worth mentioning the *Maxi II*, beyond the opportunity it gave us for an academic exercise? It is still possible that someone listening to maritime traffic may learn something of the vessel indirectly. A reference could be made during a telephone call or during a conversation between two captains. Even something heard by a monitor may be of use; much can be deduced by piecing together bits of information. If nothing else, the experience can also show us what can happen from a simple morning cruise.

The initial search was called off after four days by the French officials in Martinique and also by the Americans; however, a second search was started in Honduras in mid August. The currents in the Caribbean are such that the boat could have gotten near shore and then have been carried out by the next current, or tide.

Those aboard are well able to take care of themselves and are good seamen. Even three months later there is still hope for the survival of the crew of the *Maxi II*. One of the crew, ironically, had just finished reading Steven Callahan's *Adrift*, which tells of the eighty day "adventure" Callahan had while drifting about the ocean in a life raft. I hope I can offer an equally happy ending to this story.

Since this is the last column until 1995, I'll be the first to wish you a very Merry Christmas, Happy Chanukah, and every success in your endeavour during 1995.

TABLE 1: Caribbean Maritime Stations

| Station Name | Callsign | CW | SSB |
|--|----------|--|---|
| Bridgetown Radio (Barbados) | 8PO | 6379.5 kHz 8449.3 12709 16947.6 | 2182 kHz 2582 2723 4375 8764 8791 13113 17359 |
| Fort de France Radio (Martinique) | FFP | | 2545 |
| Havana Radio (Cuba) | CLA | 4225 4235 6337 6454 8496 8573 8690 12763.5 12748 12792 13062 16961 17165.6 22610.5 22649 | 4357 4408 8743 8750 13158 17317 17323 22750 |
| Havana Radio (Cuba) | CLT | 2182 2198 2447.5 2582 2694 | 2760 |
| Kingston Radio | GYI | 3535 6470.5 8465 13065 16947.6 | 2182 2587 2590 3535 4369 4402 6513 8752 13146 |
| Loize Radio (Puerto Rico) | WCT | 2530 | |
| Port au Prince Radio (Haiti) | | 2738 | |
| St. Thomas Radio (U.S. Virgin Islands) | WAH | 2182 2506 2585 4357 6510 6513 8728 8743 13077 13080 17245 17248 22762 | |
| San Juan Radio (Puerto Rico) | NMR | 11201 | |
| Santo Domingo Pilot Radio (Dominican Republic) | HIA | 2638 2738 8642 | 4334 6491.5 8694 |
| Willemstad Radio (Netherlands Antilles) | PJC | 2550 4370 6510 8725 13095 17260 | 13042.5 17170.4 |

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The 500 Channel Myth

Have you ever been to an antique auction and found yourself caught up in the frenzied bidding? The urgency of the auctioneer's voice and the clenched-jaw determination of the other bidders may force you to react in a way that you ordinarily wouldn't. Before you know it, you've just bid \$500 for a manure spreader and you don't even own a tractor!

Somewhere—and researchers are looking around Marshall McLuhan's grave for clues—the press announced that the future for television would include 500 channels. With that little, and totally pointless, factoid crowding their already limited minds, public relations experts for every television related company went to work. Before anyone could get a rational answer to the question, "Just what are we going to see on all these channels?" the television industry started the bidding war.

The Telephone Conglomerates, always eager to find a new way into your checkbook, announced that through an intricate network of fiber optic cables (which had not been laid) 500 channel delivery and a dial tone would be at your doorstep in a few short years. The Cable Conglomerates, fearing their worst nightmare (that they would fall out of your checkbook), announced that, with the help of system fine-tuning and digital compression, your 500 channels could be just a year away. Then came the Satellite Conglomerates (some of whom were also Telephone and Cable Conglomerates), announcing that the game was over: "We've got compression, 150 channels and we're here now, so, PAY UP!"

Real State of the Art

Forget the publicity promises and the sales pitches. What's really out there and what's really happening? There are basically five ways to enjoy television. First is the old fashioned over-the-air method in which one buys a TV set, attaches some form of outside antenna, and becomes entertained/informed/nauseated (depending on one's expectations).

This method is by far the cheapest, with a complete system (a used TV set and the dinkiest antenna Radio Shack sells) for under \$100. Number of channels receivable will vary between one very snowy, unwatchable picture to more than twenty if you live in a metropolitan area. Monthly fee: zero.



DBS is all the hype in department stores these days. Is it worth it? (Photo by B.W. Battin)

This method frees up untold disposable income for more intriguing and far more costly hobbies such as SWL/scanning/ham radio or horse racing.

The Cable Option

Next is the genuine, old-time, dinosaur-breath, cable TV. Here, depending on the decrepit condition of your local system, anywhere from 10 to 150 channels of *something* can be delivered. (Even if that "something" is just a billboard announcing that something *really* interesting is on the next channel).

More sophisticated systems offer pay-per-view movies and a modest line-up of audio services, most of which are available to anyone with a decent FM receiver. Monthly fee: \$15-\$75 depending on the severity of your PPV habit. Big drawback: fee increases appear to be linked to your income taxes, i.e. always rising.

The DBS Option

Next is DBS. Here's where the fever pitch gets cranked up. There are basically three players. To be sure, there are twice that number who are trying to get in on the scheme and are making even more noise and promises, but for now there are only three actually up and running companies: DirecTV, USSB, and Primestar.

Primestar launched first, several years ago and is technically not a true DBS broadcaster. This is because the international governing body which governs these sorts of

bodies maintains that Direct Broadcast Satellites can operate only on the higher end of the Ku band using circular polarization.

Primestar works out of the traditional ITU region 2 Ku band (on Satcom K1, 85 degrees West) with its horizontal and vertical polarizations. K1's 45 watt per transponder output was big stuff back in 1985 when it launched, but pales compared to DBS 1's 120 watts. This difference in output has required Primestar to market its system with three foot diameter dishes compared with DirecTV and USSB's 18 inch antenna—a big difference to an industry obsessed with dish size.

Until just recently Primestar programming was transmitted with an encrypted analog signal. Now they use General Instrument's Digicipher system which features 5:1 video compression. By the time you read this Primestar will offer 77 channels with pricing starting at \$30 and up.

USSB, corporate grandchild of broadcasting tycoon Stanley Hubbard, offers the fewest services of the DBS crowd. Using the same satellite as competitor DirecTV, Hubbard hopes to eventually weigh in at the same class as Primestar and DirecTV. DirecTV made a big splash earlier this year with its big ad campaign for its little dish.

DBS Up Close and Personal

I had the opportunity at the end of August to view the DirecTV system in operation at our local Sears store. Here the friendly salesman was enthusiastic about this new age of satellite TV. A little too enthusiastic I thought. "You'll want to get rid of the big eyesore dish you've got now and get in on this!"

My wife asked how many channels it received. "Oh, 150!" he exclaimed. "Well, actually," I said, pointing to the display sign, "only these services are offered at this time." "Yeah, but, you'll have 150 soon!" he insisted.

While watching a movie on the system I noticed the screen would appear to freeze for a second as if it were somehow stuck. "Why

is it doing that?" I asked. "I didn't see anything," the friendly salesman answered. As for the picture itself, it was about as good as something you might tape off the air for viewing later. The images were not crisp, and the detail we're used to on our big eyesore dish was lacking. If your cable system gave you pictures this dull you'd probably call them up to complain.

Why is everyone clamoring to get these systems? This is where the auctioneer comes in. I call it Cabbage Patch Doll Syndrome (CPDS). Remember when there were actual riots at toy stores as hysterical adults fought each other over \$20 stuffed dolls? Right now DBS is the same. Egged on by public relations experts, the media is eagerly offering glowing reports on this new technology and, by my reading, very little criticism.

Consumers, who hear that unit production has been choked off, line up for the limited quantities and hope they aren't left out in the techno-cold. The DirecTV system sells for \$700 plus \$200 installation, plus \$30 and up per month for services which are identical to local cable systems.

The MMDS Option

Multi-channel Multi-point Distribution Service (MMDS)—sometimes called wireless cable—is an older and fading method of delivering television signals. Due to its limited transmitting capabilities it's doubtful that it will ever enter the 150 plus channel race. But that was never its niche. MMDS serves less populated rural areas which would have waited forever for cable service. There are roughly one tenth the number of MMDS systems as cable-TV systems in this country. Installation costs are typically \$200 with monthly fees comparable to cable fees in the area for virtually identical fare.

The TVRO Option

Finally, there's the TVRO, commonly called "satellite TV," option. Anyone reading this column for the last six years knows that this is the favored of the five. But, even so, it's not for everyone. First, the cost factor is prohibitive for many people. Local dealers I've talked with indicate that for every 10 households who inquire about a TVRO installation and require financing, only one meets with bank approval.

Secondly, there is the old stumbling block of dish size. City dwellers, many suburbanites, and those in quaint little historic towns find it too hard to fight city hall for the right to watch TV. And, too, many people are just interested in entertainment. They could care less about SCPC, data, subcarriers, wild news,

sports feeds, and all the other things that make this a fascinating hobby for some of us.

Where are the Other 350 Channels?

I knew you'd be counting. Yes, it's true; Cable, DBS, MMDS, and over-the-air TV haven't got it. Fact is, none of these are even close to a 500 channel universe. But here, with a backyard dish with C and Ku band I have access to over 500 channels of video, audio, or data exclusive of digitally transmitted services.

Granted, only about 150 of these channels are full time and many include religious channels of every stripe, an absurd number of shopping channels, and countless sports and news feeds for virtually every local TV station and school. Still, what did you expect?

If you look at a satellite TV programming guide it's not long before you see striking similarities; namely, that many of the channels are running the same programs. In a true 500 channel universe at 24 hours per day, there would be a need for 12,000 hours of programming. That's the equivalent of fifteen months of one network's daily programming. And that's just one day!

Point is, that it is not likely to get any better than it is right now. Sure, there'll be a lot of packaging and re-packaging of the same stuff we've been seeing since the early 1950's. But with a TVRO system you call the shots, pick the programming, choose what you'll listen to and when—and what's more, you'll pay less in the long run! So, what are you waiting for? Instead of paying \$900 for a limited value DBS system with poor video and audio, for the same money you can get yourself a real satellite TV system and see what everyone else is missing!

Transponder Notes

- In the "Dying Birds Dept.": A number of satellites which have given excellent service are rapidly ending their days in the Clarke Belt. Notable among them are Galaxy 3 (93 degrees W.), Satcom F2 (72 degrees W.), and ASC 1 (128 degrees W.). All are C band with ASC having some Ku inhabitants.

There is quite a scramble to get new locations for the services they carried, but a few things are hampering progress. First, the demise of Anik E2, then the delay of several Ariane space launches, and the rapid increase of entrepreneurs ready to test the satellite broadcasting market have put a strain on the available satellites. In addition, next

year will see another wave of older satellites running out of gas. Long term transponder space is said to be at a premium.

Even though Anik E2 has been restored it's still not at 100 per cent. Past customers are hanging onto their replacement transponders in case Anik E2 fails again.

- In the "New Channels We Can't Live Without Dept.": A string of Superstations are coming on line including WFLD-TV (Chicago), KOMO-TV (Seattle), KPIX-TV (San Francisco), and KNBC-TV (Los Angeles). Other channels of note: BET JAZZ, Galaxy 7/21 (from the folks who give us Black Entertainment Television (BET); The Talk Channel, unknown location; Home & Garden Television, G1/20; CNN International, Galaxy 1/15; The Golf Channel, G7/7; Caribbean International Network, G4/7. Are we up to 500 yet?

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How Low Will It Go?

Selecting a new receiver can be a challenging task. There are so many models to choose from, each with an array of sometimes confusing features. Only a careful study of the specifications, and some time spent reading reviews will help you be sure of your choice.

If longwave coverage is one of your criteria for that new (or used) rig, this month's column is meant for you! I've compiled a list of many receivers from leading manufacturers which include coverage below 530 kHz. (See Table 1.)

I've divided the table into two receiver categories: Tabletops and Portables. Tabletop units will of course have the greatest number of features but are far more costly than portables. On the other hand, an inexpensive portable may be perfectly suitable for casual listening to local beacons, or for chasing beacons when you're on the road. Be aware, however, that some portables lack a BFO—something that's important for serious DXing.

My intent is not to rate the receivers on their performance—that job is best left to the folks who do that sort of thing professionally. What the table will do is show you which sets include longwave coverage, and what the extent of coverage is. As always, be sure to check the full specifications of any radio you are interested in.

More Shutdowns

It shouldn't come as a surprise, but the Coast Guard has formally announced its plans to decommission several more maritime beacons—this time in the 5th District (Mid Atlantic Seacoast). The following stations are scheduled to be shut down *no later than* December 31, 1994—better log 'em while you can:

| FREQ | ID | LOCATION |
|---------|------|------------------------|
| 322 kHz | "BI" | Barnegat Inlet, NJ |
| 325 kHz | "CM" | Cape May, NJ |
| 324 kHz | "WI" | Wachapreague Inlet, VA |
| 306 kHz | "HI" | Hatteras Inlet, NC |
| 310 kHz | "SP" | Smith Point, VA |
| 316 kHz | "AC" | Atlantic City, NJ |
| 293 kHz | "OC" | Ocean City, MD |
| 314 kHz | "OI" | Oregon Inlet, NC |
| 303 kHz | "OA" | Oak Island, NC |
| 314 kHz | "CP" | Cove Point, MD |

There is a bright side to these shutdowns. With fewer beacons on the air, the band is

| TABLE 1 | | |
|---|----------------------------|--|
| <i>Sample Listing of Longwave Receivers</i> | | |
| <u>Receiver</u> | <u>Longwave Freq. Cov.</u> | |
| TABLETOP RECEIVERS | | |
| Watkins-Johnson HF1000 | 5-530 kHz | |
| AOR 3030 | 50-530 kHz | |
| Drake R8 | 100-530 kHz | |
| JRC NRD-535D | 90-530 kHz | |
| Kenwood R-5000 | 100-530 kHz | |
| Kenwood R-2000 | 100-530 kHz | |
| ICOM R-7 IA | 100-530 kHz | |
| Lowe HF-150 | 30-530 kHz | |
| Lowe HF-225 | 30 kHz-530 kHz | |
| Yaesu FRG-100 | 50-530 kHz | |
| PORTABLES | | |
| Grundig Satellit 700 | 150-353 kHz | |
| Grundig Yacht Boy 400 | 144-353 kHz | |
| Sangean ATS-803A | 150-530 kHz | |
| Sangean ATS-818CS | 150-530 kHz | |
| Sangean ATS 808 | 150-530 kHz | |
| Sony ICF-SW77 | 150-530 kHz | |
| Sony ICF-SW7600 | 150-530 kHz | |
| Sony ICF-SW55 | 150-530 kHz | |
| Sony ICF-2010 | 150-530 kHz | |

opened for reception of more distant stations, especially if any of the above happen to be local "pests" to you. These types of changes are one good reason to keep a close ear to the band.

And Now the Good News

While the Coast Guard is busy shutting down beacons, the FAA has actually established some new ones. Ken Stryker, unidentified Beacons Editor for *The Lowdown* reports the following U.S. beacons are

newly authorized or on the air:

| FREQ | ID | LOCATION |
|------|-----|---------------|
| 200 | AOC | Arco, ID |
| 239 | BPW | Osceola, AR |
| 247 | VED | Leesville, LA |
| 260 | EPM | Eastport, ME |
| 346 | GHW | Glenwood, MN |
| 356 | AQP | Appleton, MN |
| 395 | CWV | Claxton, GA |
| 407 | AKT | Appleton, WI |

NAVTEX Revisited

Back in July, I described a simple way to decode NAVTEX teleprinter broadcasts on 518 kHz with a computer and an RTTY terminal unit. As a tugboat captain, Doug Robertson (CA) is a regular user of NAVTEX and he's checked in with some more interesting facts about the service and the commercial equipment used to receive it.

Doug says that the least expensive NAVTEX receiver he's seen costs around \$820 (List price \$995). He adds that the only real difference between one of those specialized units and the setup described here in *MT*, is that the commercial system automates the message gathering process.

For instance, the NAVTEX receiver decodes the transmission, which contains a Station ID, message content code, and a message serial number. The microprocessor within the receiver can be set to display *only* the messages relevant to the user, and only from the desired stations. Also, with the serial number embedded in the message, transmissions that have already been received can be screened out. In this way, the mariner is not flooded with messages that do not apply to him.

Doug reports having received NAVTEX as

| TABLE 2 | | |
|------------------------------------|-------------------|-------------------------------|
| Selected NAVTEX (518 kHz) Stations | | |
| Station Identifier | Location | Trans. Times (UTC) |
| Q | Long Beach, CA | 0045,0445,0845,1245,1645,2045 |
| c | San Francisco, CA | 0000,0400,0800,1200,1600,2000 |
| w | Astoria, OR | 0130,0730,1330,1930 |
| i | Kodiak, AK | 0300,0700,1100,1500,1900,2300 |
| X | Adak, AK | 0300,0700,1100,1500,1900,2300 |
| O | Honolulu, HI | 0040,0440,0840,1240,1640,2040 |
| v | Guam | 0100,0500,0900,1300,1700 |

TABLE 3**Beacon Loggings**

| <u>Freq.</u> | <u>ID</u> | <u>Location</u> |
|--------------|-----------|----------------------|
| 194 | TUK | Nantucket, MA |
| 216 | CLB | Wilmington, NC |
| 241 | SFZ | Smithfield, RI |
| 245 | YZE | Gore Bay, ONT. |
| 257 | FFF | Plymouth, MA |
| 280 | CQX | Chatham, MA |
| 289 | CB | Cape Henry, VA |
| 293 | MP | Montauk Pt., NY |
| 307 | R | Snug Harbor, ONT |
| 322 | H | Seals Island, NS |
| 323 | BSD | Davids Head, Bermuda |
| 344 | JA | Jacksonville, FL |
| 364 | CKK | Miami, FL |
| 368 | L | Toronto, ONT |
| 379 | BRA | Asheville, NC |
| 385 | HYX | Saginaw, MI |
| 396 | ZBB | Bimini, Bahamas |
| 428 | COG | Orange, VA |

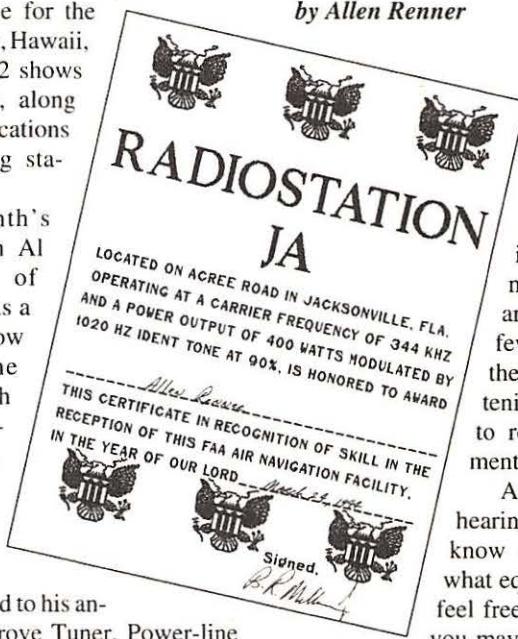
far away as 500 miles at nighttime. He further improved his reception by installing a giant-size grounding plate to the underside of his boat. The ground plate also helped improve

LORAN reception.

He included a recent update to the NAVTEX schedule for the West Coast, Alaska, Hawaii, and Guam. Table 2 shows the new schedule, along with the IDs and locations of the transmitting stations.

This month's loggings are from Al Hemmalin of Middletown, RI. As a newcomer to the low band, Al says he hasn't had this much fun in years! For receiving equipment, he splits his time between a Drake R8 and a Yaesu FRG 100, both of which are connected to his antenna through a Grove Tuner. Power-line noise can be a problem at Al's location, so he oriented his antenna at right angles to the powerlines for minimum noise pickup. A

Below is a nice QSL from beacon "JA" in Jacksonville, FL (344 kHz). Submitted by Allen Renner



sampling from his extensive log is presented in Table 3.

November is the month that long-wave DXing really kicks into high gear. The noise is gone, signals are stronger, and with fewer outside tasks to do, there's more time for listening. Now is a great time to rediscover the excitement of low band DXing.

As always, I'd enjoy hearing from you. Let me know what you're hearing, what equipment you use, and feel free to ask any questions you may have about the band.

You can reach me by writing to: *Below 500 kHz*, c/o MT, P.O. Box 98, Brasstown, NC 28902. Happy Thanksgiving to all!

B E Y O N D THE B A S I C S

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The eight Omega stations are run by an international partnership. The locations of the eight Omega stations are as follows:

| <u>Station</u> | <u>Location</u> | <u>Station</u> | <u>Location</u> |
|----------------|-----------------|----------------|-----------------|
| A | Norway | E | La Reunion |
| B | Liberia | F | Argentina |
| C | Hawaii | G | Australia |
| D | North Dakota | H | Japan |

You will know when you've tuned into Omega. Their signals sound like a slow melody of musical notes repeated over and over—some stronger than others.

If you'd like to know more about Omega, or other Coast Guard navaids, you may want to check out the Coast Guard bulletin board system (BBS) at (703) 313-5910. This is a free computer service—your only charge being the long distance telephone call. Also, you can listen to WWV at 14 minutes after the hour (43 minutes after for WWVH) for a brief update on Omega status. These broadcasts report propagation anomalies and maintenance shutdowns for individual stations.

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Reviewed by Larry Miller in April '93 "MT"

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Six Meters

I have often mentioned in this column that six meters is a sparsely occupied band. The major reason for this has been the severe TVI that it can produce in fringe areas of TV channel 2.

The advent of cable TV, however, has largely removed this obstacle, which has encouraged a lot of hams to re-occupy our lowest VHF band... A very good thing, I might add, since lack of occupation and losing frequencies go hand in hand.

Advantages of Six FM

Six meter FM activity is taking off in many areas of the country as more folks find out how much fun it is to be on six instead of two meters. Unlike two meters, six provides lots of opportunities for real DX (i.e., coast to coast and overseas) using simple equipment and antennas. In addition, the shadow effect is not as troublesome on six as it is on the higher frequencies, and simplex operation in hilly terrain is much easier.

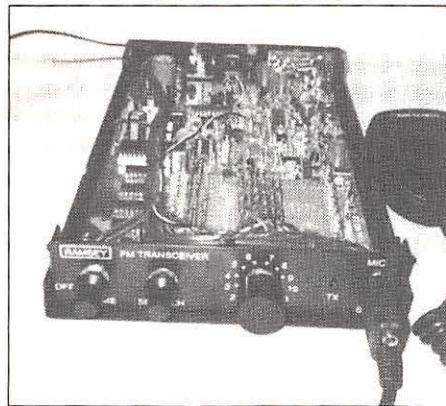
Listening on the six meter calling frequency (52.525 MHz) brings more contacts as the popularity of this band grows. It is often surprising what one will hear on this frequency. For example, one evening a few weeks ago I heard 11 states in a period of four or five hours of monitoring. The best DX was Texas, about 1600 miles from this QTH!

The increased activity is due in part to several reasons, first, as mentioned, the specter of TVI no longer hangs over us; second, some manufacturers, realizing the potential of six, have started producing gear for this band again.

The Ramsey FX-50

I have had a multi-band rig that covered six for several years, and had occasionally worked six FM. I wanted to buy something strictly for FM, but did not care to pay the price most of the gear was going for. As a consequence, when Ramsey Electronics announced their FX-50 six meter FM transceiver kit at a price of \$149.00, I decided to obtain one.

When the kit arrived I was surprised at several things. First was the instruction manual, second, the quality of the parts and the excellent pc board.



My completed FX-50 kit has six of twelve possible channels programmed in it (front right).

The manual is an education in itself. Unlike the old Heath manuals, Ramsey takes you through a course in FM transceivers as you build. It thoroughly explains the function and operation of each stage of the rig. If you understand basic electronics, this manual will give you a good working knowledge of how VHF FM transceivers function.

The kit can be completed successfully by the first-time kit builder, provided he can do a decent job of soldering and is willing to take time to read and understand each stage of construction. If you are not sure, then get someone who has built a few kits to help you.

You will need a good soldering iron (25 watts with a fine tip) and a few basic tools. To align the unit, all that is needed is a good digital volt ohm meter, a 5 watt 50 ohm dummy load, and a VHF RF power meter or "rf voltmeter" (your vom can serve as an rf voltmeter by simply adding a diode in series with the positive lead).

A frequency counter or accurate receiver is also required. While not everyone has a frequency counter, it should not be difficult to find a local ham who has one and is willing to lend a hand.

When building the kit, I did read the manual as the rig progressed from stage to stage. Total time to build the unit from open box to operating rig was about 25 hours. If you are new to electronic construction, allow double this time. I found no problems building the unit except for a wire that I broke accidentally.

Programming the FX-50 requires you to install diodes in a matrix for each frequency

you plan to operate. The unit provides switching for 12 frequencies (I only programmed six at present in mine); however, it is possible to leave one switch position open and use it to externally program additional frequencies into it (more on this in a later column).

The unit uses the Radio Shack 19-310 speaker/mike. The Radio Shack unit is okay, but I do not like the sound of the audio from it, and made a minor modification to allow me to use an external speaker.

How's It Work?

Power output from my particular unit reads just a bit below five watts on a Bird wattmeter. Audio output is 2 watts, which is more than adequate.

I do not presently have a six meter vertical antenna (vertical polarization is required in most areas for six meter FM). I do have a Cush-Craft R-7, which "sort of" loaded up on six, although very inefficiently.

The first contact with the FX-50 was through a repeater about 70 miles away. There is a two meter repeater on the same tower and I could not open it with 25 watts to a Ringo Ranger!

That evening several contacts were made on 52.525 simplex with locals. There is a 52.525 remote base about 50 miles from here and most of the contacts were through this base with the other stations being on either two meters or 70 cm link.

The following morning a station in Florida was worked on simplex followed by one in Georgia and another in Virginia on a very weak band opening. Later the same day I heard several "3" callsigns in QSO and called them; they were 300 miles away in the Pittsburgh area of Pa. Several contacts followed in Ohio and Michigan. Just wait 'til I get a good antenna up!

For the \$149.00 price tag this is one impressive little rig. I highly recommend this unit to anyone wanting to get started in six meter FM. The FX-50 does not have a lot of bells and whistles; however, it does have built in provision for connecting your TNC for packet operation.

I suggest purchasing the cabinet kit Ramsey offers rather than rolling your own. The Ramsey cabinet looks good and of course everything fits into it perfectly. The cabinet will add another 29 dollars to the price. But even at

\$180.00 the FX-50 is a bargain!

The FX-50 is available from RAMSEY ELECTRONICS, 793 Canning Parkway, Victor, New York 14564 or phone (716) 924-4560. See ya on 52.525!

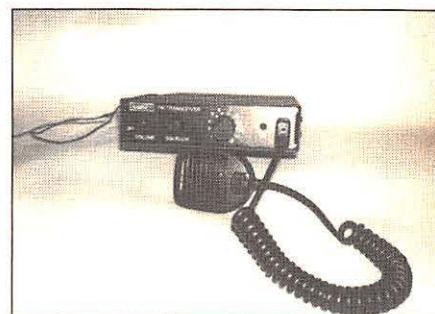
WAS via Special Event

Some of the local gang started trying to work all states (WAS) by working only special event stations. I especially like this idea and have been working on the project myself. Although many special event stations are advertised each month in the ham magazines, it is a difficult task. The difficulty lies in the fact that generally the special event stations are active only on weekends, and often are not very loud.

Other problems include not giving specific frequencies, but simply stating operation in the general class subbands. They should give specific frequencies plus or minus five or 10 kHz. Other stations limit operation to only one or two bands; which effectively reduces the area they cover. If you are running a special event station, by all means operate all bands from 80 to 10, on both SSB and CW if possible.

Working special event stations is not only fun, it is usually educational as most of the stations provide information about the particular event they are celebrating.

That's all for November. Speaking of celebrating—have a good Thanksgiving. 73 de Ike, N3IK



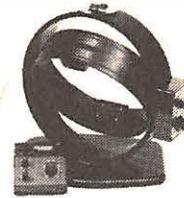
The Ramsey cabinet looks good and of course everything fits into it perfectly.

Bob Leonard's Ham DX Tips

This is the time of year when excellent DX can show up on the lower HF bands, so don't forget to check in on them as we enter the second month of the contest season. **AUSTRALIA** VK5BC (H.F. Lloyd, Box 473, Berri, SA 5343, Australia) has been on 1830 kHz CW (with some LSB) between 1030 and 1150 UTC. **CONTESTS** Starting the month is the ARRL CW Sweepstakes starting on the 5th and ending on the 6th. Next comes the Japan International DX contest the 11th and 12th. The ARRL SSB Sweepstakes take place on the 18th and 19th. Rounding out the month on the 25th and 26th is the CQ WW CW contest. Contest activity will take place on all HF bands, except 10, 18, and 24 MHz. **MT ATHOS** RTTY DXers can now add this super rare DXCC country to their logs by looking on or near 14083 kHz at 1145 UTC most days for SV2ASP/A (Monk Apollo, Dochiarou Monastery GR-630 87, Mt Athos, Greece). **PARAGUAY** ZP6CW (Doug Wooley, P.O. Box 73, Caapcupe, Paraguay) plans to be active in the 75 meter LSB "DX Window" (3790 to 3800 kHz) most evenings over the next few weeks. **PHILIPPINES** Active here for the next 11 months will be DU7/SM0CNS (Thomas Bevenheim, Ronda, Ceuba 6034, Philippines). As he is on a semi-rare IOTA island he is expecting to be active on the IOTA frequencies on 14260, 21260, and 28460 kHz often around 1100-1300 UTC. **ST KITTS** A DXpedition, making this country not only more active on HF SSB, but on six meters as well, will occur between the 19th and the 25th. WB8GEW (Adrian P. Fallert, 27 Verlynn Ave., Hamilton, OH 45013) will be active as V47NF 160 to 10 meters SSB, while WZ8D (John Walker, 1930 Meredith Dr, Loveland, OH 45140), a noted VHF/UHF SSB/CW DXer, will set up a beacon on 50055.5 kHz using the callsign V457WZ. John will be active as well on six meters using that same callsign. Check around the "international calling" frequency of 50110 kHz if you hear the beacon. **TAJIKISTAN** There are two chances for RTTY DXers to land this country. First, EY8WW is on or near 14080 kHz at 0200 UTC daily. Near 0500 UTC you can capture EY8MM operating on 14083 kHz. QSL both to their QSL manager: DL8WN Michael Kaiser, Rosengarten Str 13A, D-55596, Waldboeckelheim, Germany. **TURKMENISTAN** EZ5AA offers this difficult catch on 7005 kHz CW daily starting around 0100 UTC. QSL requests should be forwarded to his QSL manager: W5BWA, Huie A Miler, 5812 Hiawatha Dr., Alexandria, LA 70452. **UGANDA** 5X1F can be found operating SSB around 14185 daily between 2300 and 0100 UTC. His QSLing chores are handled by WD1DQC, Peter Munroe, 41 Cherlyn, Holliston, MA 01746.

Hope you have an excellent Thanksgiving Day, and of course don't forget the veterans on Nov 11 (Remembrance Day in Canada). 73 de Rob

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Puerto Rican Anti-Castro Clandestine Busted

According to a *San Juan Star* article by Marty Gerard Delfin, **Frenta Nacional Cubano** was busted by the FCC on July 27. This anti-Castro clandestine station was operating on 7020 kHz with several kilowatts from Hacienda Las Carolinas, a cattle ranch near Salinas, Puerto Rico.

The FCC acted after it received complaints about the clandestine from the Cuban government. Interestingly, the bust coincided with an announcement by President Clinton that the United States was increasing the volume of its **Radio Marti** broadcasts to Cuba.

The *Star* reported that the transmitter was located on property owned by Domingo Sadurni Sr., a Cuban exile who is known in Puerto Rico as an influential "millionaire-developer." Sadurni is a member of the board of the conservative Cuban American National Foundation. The powerful CANF, headed by Jorge Mas Canosa, also operates the anti-Castro quasi-clandestine **La Voz de la Fundacion**.

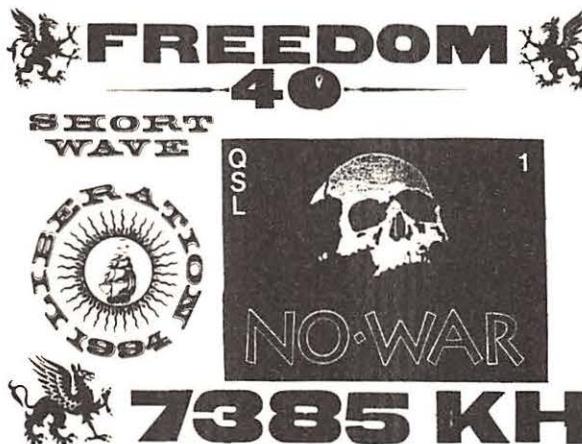
Interestingly, the FCC did not seize the station's transmitter, although the *Star* reports that the FCC has not ruled out a "hefty fine." The newspaper quotes an anonymous Cuban national, who speculated that either Sadurni set up the station because he disagrees with some CANF policies, or that "the station is a front for the CIA." FCC field office engineer Jeff Young said that the FCC decides whether to confiscate equipment on the basis of the "type of interference it caused."

New FCC Bureau Chief

According to *Crain's Cleveland Business*, FCC Chairman Reed Hundt has restructured the agency by naming new personnel to head most of the organization's six bureaus. As part of the reorganization, longtime Chief of the Field Operations Bureau Dick Smith has been replaced by Beverly Baker. Four of the FCC's bureaus are now headed by women.

Baker, formerly an FCC attorney, is the first Field Operations Bureau Chief who is not a professional engineer. Smith, who had been chief since 1981, has been reassigned to be the head of the FCC's Office of Engineering and Technology.

FCC Commissioner Jim Quello criticized



The Postal Service mangles a Freedom 40 QSL

Hundt's restructuring, saying, "If it ain't broke, don't break it." Baker defended her credentials, pointing out that "I was picked for my management skills, not for being a lawyer or an engineer." She told *Crains* that "We see this more as a management job."

Pirate DXers have a strong interest in this personnel switch. Smith has officially been responsible for all of the pirate station busts in the United States for the last 13 years. So far it is unclear if Baker will institute any changes to the FCC's enforcement practices toward unlicensed broadcasters.

Radio Democracy

The September issue of *MT* contained Jim Pogue's excellent, timely article about the United States' airborne **Radio Democracy** clandestine. The airborne clandestine transmits from Air Force EC-130E aircraft near Haitian airspace on 1035 kHz.

Few people heard the station at first, but better signal reports are now pouring in. One of the first was noted by Dave Valko of Dunlo, PA, in *Fine Tuning* issue #748. Since then, *MT* readers Mike Hardester of Jacksonville, NC, and Rob Keeney of Overland Park, KS, both sent in clear logs of the station. Programming appears to consist mainly of announcements to listeners in what seems to be Creole.

I have checked for the station on an almost daily basis. I regularly hear a heterodyne on 1035 kHz, but audio only appears occasionally in northern Ohio under good conditions. Southern and East Coast DXers

should have a good shot at this one as long as the Haitian political situation is tense.

Taiwan Pirate Confrontation

Many semi-commercial pirates have been operating openly for some time in the Republic of China. However, 14 prominent pirates were raided by Taiwan police on July 28. Hundreds of taxi drivers, who are among the pirates' most visible supporters, took to the streets in protest.

The taxi driver demonstrations led to violence, which is highly unusual in Taiwan. Most of the pirates support opposition groups such as the Democratic Progressive Party, which alleges the currently licensed stations are a government monopoly. The ruling Kuomintang has responded by promising expanded broadcasting licenses.

Many of the banned pirates returned to the air after the large street demonstrations in their favor. A reward has been posted for the apprehension of two men who stabbed the Government Information Office official who was responsible for the pirate raids. We thank several *MT* readers who sent in various press accounts of the events, including Michael Csontos, Patrick Crumhorn, Scott Edwards, and Marylin Jaco.

Strange French Pirates

Many *MT* readers have noticed a surprisingly regular schedule of French language pirate transmissions on 6912 kHz. The frequency supports a very unusual chit-chat net that may be coming from fishermen or persons in the transportation industry. But, one of the net members is a pirate at heart, playing and singing French folk tunes on the air.

I first noted the station on August 29 while listening to the reactivated Europirate **Radio Dublin** on 6910.6 kHz, but it appears that this station is often active on a daily basis. Yolanda Lewis of Elgin, IL, Rob Keeney, and many others have been logging it. Yolanda says some of the conversations are not French, but the second language has not yet been identified. No ID for this one so far, but it makes interesting listening. Signals have been good throughout much of North America.

QSL Controversy

A slight hubbub erupted during the late summer over the QSL policies of pirate stations. Pirates have historically been very good verifiers in response to reception reports from listeners. Most of them still welcome letters from listeners. But, both ends of the QSL process were briefly strained by developments at **Freedom 40** and **Spam Radio**. Both stations have been logged in recent issues of *MT*.

The Freedom 40 operator announced at first that he would only verify reports accompanied by xerox copies of five QSL's from stations operating during the massive "Shortwave Liberation" pirate transmission outburst (covered last month). But, in an interview with *MT*, Freedom 40 said that it was only trying to promote activity among pirate stations. The station operator assured our readers that if Freedom 40 was your first pirate station, he will welcome your reception report.

We have proof that Freedom 40 is now verifying reports. My own QSL is pictured this month. Unfortunately, it arrived in a plastic envelope from the Boston office of the United States Postal Service, who apologized for ripping off the lower right hand corner of the nice card during mail processing.

The content of Spam Radio's QSL caused another controversy. The station reliably verifies reports with a photo sheet that cannot be described in a family publication such as *Monitoring Times*. In fact, the picture is sufficiently disgusting that it would not be printable in more risque magazines either. In fact, the skin magazines would not even discuss the subject matter of the Spam Radio QSL.

MT reader David Chapchuk of Scranton, PA, received one of the notorious veries after he sent in a reception report through the Faribault maildrop, as I did. Be advised that if you do the same, you may not be pleased with the forthcoming results in your mailbox.

What We Are Hearing

Radio For Peace International's move to 7384.7 kHz has turned out to be permanent, so most pirates are now using other frequencies in the 41 meter band. No standard frequency has emerged, but spots near 7475, 7405, 7445, and 7470 kHz have been popular among pirates when other stations are not blocking the channel. Even the old standby 7415 kHz is seeing some activity at times.

Maildrop stations used for correspondence by North American pirate stations reported this month include PO Box 452, Wellsville, NY 14895; PO Box 605, Huntsville, AL 35804; PO Box 17534, Atlanta, GA 30616; PO Box 2024, Faribault, MN 55021; PO Box 146,

RADIO MAGIC IS FREE BROADCASTER AND FREE RADIO LISTENER



Chapchuk's excellent Russian Radio Magic verie

Stoneham, MA 02180; and PO Box 1461, Perm 614036, Russia. When writing to a pirate station, you should enclose three mint 29¢ stamps to USA addresses and \$1 US to foreign addresses for return postage.

Bob Dylan Radio- 7466 at 0200. The music on this one obviously is dominated by Bob Dylan songs, but William notes that they mix in comedy from sources like the Marx Brothers and National Lampoon. Addr: None, but verifies ACE bulletin logs. (William T. Hassig, Mt. Prospect, IL)

He Man Radio- 7415 at 0200. Although it's not guaranteed, the station sent in a reminder that He Man was active on Halloween in 1993. Perhaps we should look for him again on Halloween this year. The holiday is traditionally a big one for pirate activity. Addr: Blue Ridge Summit. (He Man, QTH unknown)

K-2000- 7472 at 0015. This station always produces an elaborate and hilarious parody of the shortwave DX hobby. After a period when they were refusing to verify valid reception reports, their QSL's are now arriving in the mail. Addr: Stoneham. (George Zeller, Cleveland, OH)

North American Pirate Relay Service- 7385 at 0215. Richard T. Pistek is the source of relays for many pirate stations, quite a few of which are otherwise very difficult to hear. (Chapchuk)

Radio Airplane- 7385 at 0315. Captain Eddy still uses his airplane for in-flight transmissions. There is apparently no truth to the rumor that the Defense Department gave him the **Radio Democracy** contract in Haiti. Addr: Wellsville. (Alexander Pangburn, Alta Loma, CA)

Radio Azteca- 7413 at 2300. Bram Stoker produces an extremely funny parody of shortwave DXing and DXers. The station has developed a friendly rivalry with K-2000, where the programming format is similar. Addr: Wellsville. (Robert Ross, London, Ontario)

Radio Doomsday- 7470 at 0200. In a major development, Nemesis committed suicide during a September 4 broadcast. It is therefore possible that this station's operations will diminish. Addr: Wellsville, but announces that they will no longer reply. (Pangburn)

Radio Magic- 5750 at 0300. This Russian pirate maintains a relay relationship with **NAPRS**. One of their recent transmissions suffered from German numbers station interference on this unusual frequency. David is happy to report that he received the QSL pictured this month! Addr: Perm. (Chapchuk)

Radio Outhouse- 7385 at 0330. The crude, good ole boy humor on this station from an Arkansas outhouse transmitter has proven popular with pirate listeners. What does this tell us about the programming preferences of pirate DXers? Addr: Still none. (Pangburn)

Voice of Journey- 7385 at 0200. This one features music by the rock band Journey via an **RBCN**

transmitter relay. Addr: Atlanta. (Direct from the station)

Voice of Laryngitis- 7385 at 0000. After returning from a vacation in Romania, Gigi found QSL #340 in her mailbox from this station's longtime verie signer Stan Huxley. Addr: Wellsville. (Gigi Lytle, Lubbock, TX)

WEED- 7415 at 0400. Their slick pro-marijuana rock and comedy shows are still entertaining, but their QSL verifications have recently been arriving without any date on them. Addr: Huntsville. (Ross) **WKND**- 7415 at 2330. Radio Animal has returned to the air after a long period of infrequent activity. Even better, Steven found that he is dusting off old reception reports and sending out QSL's! Addr: Blue Ridge Summit. (Steven Cline, Indianapolis, IN) **WLIS**- 7413 at 1345. Jack Boggan's unusual station programs actual interval signals from licensed shortwave broadcasters. Their amusing slogan is, "You're listening to the greatest interval signals from the 60's, 70's, and 80's." Addr: Blue Ridge Summit. (Zeller)

WRFW- 7378 at 2345. Also known as Radio Free Wisconsin, this operation has resumed activity lately. They mix rock and blues music with drama, sometimes including relays of actual old time radio broadcasts from decades ago. Addr: Faribault. (Zeller)

Xray Yankee Zulu- 7378 at 0000. Sometimes this one relays programming from other pirates, but it mainly stands out as a digital pirate that transmits in RTTY mode. Get out your equipment catalog to dream about the digital code interface equipment! Addr: None, but reliably verifies logs in *The ACE*. (Zeller)

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WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Reel-Talk

One of radio monitoring's more enduring schisms pits "pure" DXers against "pure" program listeners. Theoretically, the pure DXer tunes in a station only long enough to



grab an ID and enough details for a reception report and—wham—they're gone.

On the other hand, the pure program listener isn't moved by the fact that he's hearing a 250 watt daytimer in Porto Cervo, California, at his location in Boston, Massachusetts. He's tuning in to hear a special report on Quill Pens of the American Revolution.

As radio faces increasing competition for the attention of the average person, it has been forced to come up with new programming. From Kids Radio to Rush Limbaugh, there's someone, somewhere, doing something to try and get you to listen—but not always at the most convenient time.

Dale Stogner is president of Reel-Talk, Inc. and he has an answer. He's come up with a device that can best be described as a VCR for radio.

Reel-Talk combines an AM-FM radio, a slow-speed tape recorder, and a timer into one unit. Not unlike a VCR, you simply program the station you want to hear, the time you want to record, and put in a tape. Each tape allows you to record up to four hours. We haven't had the opportunity to test a unit—Stogner has promised to send a Reel-Talk along—but looks like a great idea.

Reel-Talk measures 6.5 inches square at the base and 12 inches tall, has a feature-packed radio and costs \$99.95 plus \$15.00 shipping and handling. It comes with a 14 day money-back guarantee and a 90 day limited warranty. To order call 1-800-766-8255.

Radio After Dark

The National Radio Club's audio magazine, *After Dark*, has been getting quite a following. I've even seen mentions of it in the professional broadcast journals. The reason for its popularity is clear—this is great stuff.

Volume 4 of *After Dark* is now available. While you may already be familiar with the lead-off article—Mindy Drayer reads Wayne Heinen's excellent *MT* article, "A Walking Tour of WWV"—there's lots more. Also featured are Fred Vobbe's interviews with Wolfman Jack and Kahn Communications owner Leonard Kahn. Kahn is one of the inventors of AM stereo.

The tape also features articles from around the country and around the world. Finally, there's the icing on the cake—bands (actual off-air recordings) of AM and FM stations from various U.S. cities.

After Dark IV is now available from the NRC for only \$9.50 and that's postpaid, and that's a great deal. Their address is P.O. Box 164, Mannsville, NY 13661.



handling. Call 1-800-351-7226 or write Official Scanner Guide, P.O. Box 525, Londonderry, NH 03053. Tell 'em *MT* sent you.

The Magic Eye

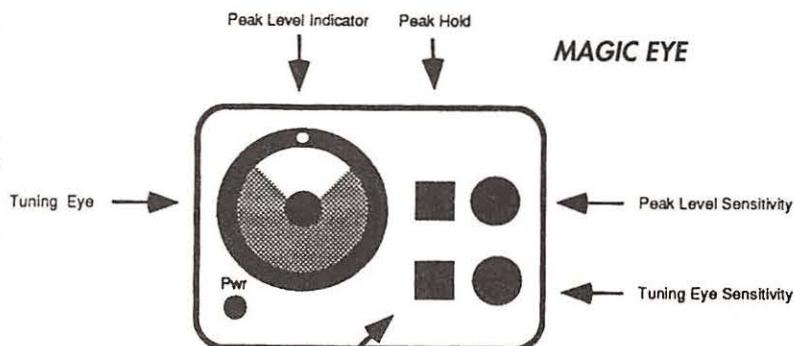
If you have a Lowe HF-150, Japan Radio NRD-525, Yaesu FRG-100 or any other radio that has poor signal strength displays, you might want to check out a new self-contained tuning accessory from Kiwa Electronics.

Craig Siegenthaler has designed a limited edition unit using the old "magic eye" (or "green tuning eye") of the 1930s, 40s and 50s.

The tuning eye (pictured below) will have two switchable inputs that are selectable from the front panel. One can be attached to the receiver's IF for effective signal strength metering. (Connection to the receiver is made by a spring-loaded microclip. Instructions show where the clip is attached for pickup of the IF signal.)

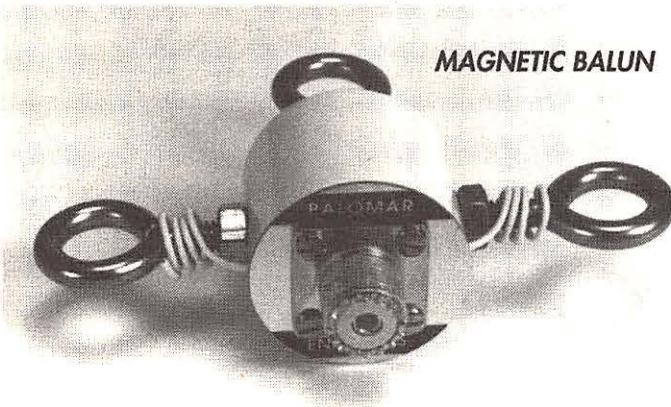
The other input can perform as an audio level display. Any signal from 20 Hz to 20 MHz can be displayed on the tuning eye.

The Kiwa Electronics Tuning Eye is available as a limited edition unit. At press time, a formal price has not been set, but you should expect to pay somewhere in the \$200 range. For the latest price information and specs, contact Craig at Kiwa Electronics, 612 South 14th Ave., Yakima, Washington 98902, or call 509-453-5492.



Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 289202.

MAGNETIC BALUN



Magnetic Balun

Palomar Engineers has introduced a new Magnetic Dipole Balun specifically designed for shortwave listeners. Called the model MDB-2, it replaces the center insulator and provides the proper balance-to-unbalance conversion for coaxial cable. The balun action prevents noise pickup on the cable shield, thus giving quieter reception.

The balun also connects both sides of the antenna to the cable shield (at DC and power line frequencies) and this eliminates charge buildup on the antenna. All static charges flow to ground, not through the radio. The balun is rustproof, weatherproof and has an SO-239 connector for coax.

You can get your Palomar engineers MDB-2 Magnetic Dipole Balun for \$39.95 plus \$6.00 shipping and handling. For more information or to order, contact the manufacturer at P.O. Box 462222, Escondido, California 92046. The phone number is 619-747-3343.

Radio Freebie

I'm always on the look out for radio freebies for readers of *Monitoring Times*. They're not

easy to come by. But this month we've got a nice one.

KNLS, the Gospel broadcaster out of Anchor Point, Alaska, has put together a new book called *DX Propagation for Beginners*. The author, Carl Mann, is a DXer of some 30+ years experience who spends his workday as a news reporter in Omaha, Nebraska.

The book is especially appropriate now that we're at the low end of the 11 year propagation cycle. There are five chapters, including "Introduction to Propagation," "Groundwave, Skywave and the Ionosphere," "The Solar Cycle" and "Using Propagation Knowledge."

Says KNLS' Mike Osborne, "Carl has written *DX Propagation for Beginners* in a simple, straight-forward style that beginners will find easy to understand. However, the book has sufficient depth to provide a propagation refresher for even the most experienced DXers."

DX Propagation for Beginners is free. KNLS does ask that you send two 29 cent stamps to cover the cost of postage. (If you order from outside of the United States, send two IRCs instead.) The address is *DX Propagation for Beginners*, Station KNLS, Anchor Point, Alaska 99556. Tell 'em that Larry Miller sent you.

Free Used Scanner List

Looking for a cheap, second (or third or fourth) scanner? G&G Communications has an excellent collection of used, refurbished scanners for sale. All are cleaned, tuned and tested and carry a full 90 day warranty. Prices start at \$25.00.

To get a copy of G&G's most recent list, send a self-addressed, stamped envelope to Gerry Oliver at 9247 Glenwood Drive, Leroy, NY 14482. Tell him that *MT* sent you.

Voice Clone

You're a ham radio operator. You like contesting. But, oh, having to repeat your call letters hour after hour! It's enough to make you want to sell your rig and take up something less strenuous.

MFJ has come to the rescue with the 432 Voice Keyer.

According to the Mississippi manufacturer, the 432 Voice Keyer allows you to operate the major portion of a contest without ever having to open your mouth. Now you can pre-record up to 20 seconds of those tough, hard-to-say phrases like, "CQ Contest, this is AA5MT," "The QTH is Pennsylvania," or the tongue-twisting "You're 5-9," and play them back over the air.

Best of all, the '432s EEPROM technology will keep your messages stored for up to ten years without any battery backup so you could—theoretically—continue to contest even after your own death. Is that heaven, or what?

The MFJ-432 Voice Keyer is

easy to use—just plug it in. Internal jumpers let you customize the '432 to your Kenwood, Yaesu or ICOM rig.

To get your 432 Voice Keyer, call MFJ at 1-800-647-1800 or write P.O. Box 494, Mississippi State, Mississippi 39762. The price is \$99.95.

Inexpensive Satellite Receiver Module

If you're looking for an inexpensive, but very effective wideband FM receiver module for 137 MHz weather fax reception—and who isn't after the last issue of *Satellite Times* came out?—you might want to check out Hamtronics' new R138 receiver.

The R138 is crystal controlled. It has four channel oscillators, which allows you to select a particular satellite by simply grounding the desired control line with an external switch. Crystals are available for all the common satellites.

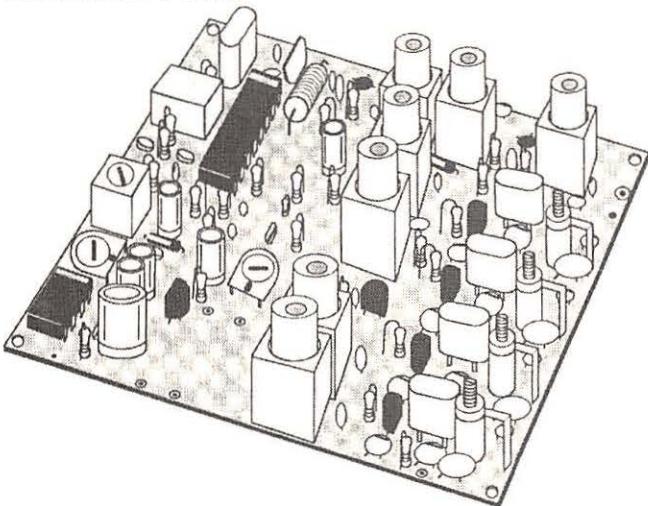
Other notable features include good sensitivity (typically 0.2 μ V), a squelch circuit that indicates when a satellite is heard, and you can use a DC output from the squelch to start a tape recorder when the satellite passes overhead.

The price of the R138 is just \$99.00 in kit form—people with kit-building experience shouldn't have too much trouble with this one; however, a signal generator is required for alignment. A wired and tested unit is available for \$169.00.

To order, or for more infor-



HAMTRONICS R138



mation, contact Jerry Vogt at 1-716-392-9430 or write Hamtronics, 65-F Moul Road, Hilton, NY 14468-9535.

Needed Advice

We're big fans of *Passport's Radio Database International White Papers*. After all, with receiver prices now towering in at levels of over four thousand dollars, it pays to shop around for a little advice. And that's what the *White Papers* provide.

The most recent *White Paper* offers 24 pages of in-depth information on the Drake SW8, a "portatop" receiver reviewed by Jock Elliott and Larry Magne.

While we don't want to give away the end of the story, we can say that the SW8 fared well. Find out more for yourself by sending \$5.95 to International Broadcasting Service, Ltd., P.O. Box 300, Penn's Park, PA 18943.

Logmaster II

We received some information on a new piece of software that the publisher bills as "a full-featured application for the automation of Amateur Radio and SWL log keeping. The printed information leads us to question its use to SWLs. For example, there's a list of fields and field sizes and we don't see one for station name—just a 10 character field for callsign. There also

doesn't appear to be any space for program details but, we'll leave the hands-on review of Milestone Technologies' Logmaster II Radio Log-Keeping System to John Catalano if he picks it for review in a future "Computers and Radio" column.

If you'd like to check out this one out on your own, send \$29.95, which includes a comprehensive manual and free telephone support, plus \$5.00 shipping to 3140 S. Perioria St., Unit K-156, Aurora, Colorado 80014-3155 or call 303-752-3382.

900 MHz News

We don't know for sure, but we're guessing that the new 900 MHz cordless phones just aren't moving as quickly as manufacturers had expected. We're basing our guess on the fact that Uniden has announced that they are marketing new *lower cost* units. Another is offering a manufacturer's rebate. Also noteworthy is the fact that these lower-cost units are analog, not digital, and can be received on scanners.

Still, the new lower-cost introduction still rings in at a suggested retail price of \$349.95—a far cry from the \$39.95 for the 49 MHz units you can find for sale in department stores.

Finally, Panasonic is now marketing a 900 MHz cordless phone/fax combination. It would be interesting, I think, to see if the fax is also transmitted over the base. If so, does this mean that the properly-equipped scanner listener could snatch faxes from the air as well? Just a thought.

While the fax/phone combination is designed for home-of-fice use, you probably won't be hearing too many of them either way. They're priced at \$1,149.95.

Comin' At You

New technology is coming at you—fast and furious. The technology itself isn't that difficult to grasp; it's just that it seems to be coming at us at an unprecedented pace. From interactive television to virtual reality and satellite news gathering, the world of communications is changing.

One way to stay on top is August E. Grant's *Communications Technology Update*. A 350 page sourcebook of comprehensive, up-to-date status reports on a full spectrum of new communications technologies, *CTU* is designed for professionals, academics, government leaders and hobbyists. Thirty-eight thought-provoking descriptions of new technologies and their applications are provided.



Focal Press

Grant, the author, is a broadcaster-turned academic who currently teaches Radio-Television-Film at the University of Texas at Austin. His book can be purchased from Focal Press, 313 Washington Street, Newton, MA 02158 or by calling 1-800-446-6520. The price is \$34.95.

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| UACC111 | Rechargeable Battery BP-2500 | \$29.95 | UACC95 | AC/DC Adaptor 1.2 Volt (Taiwan) | \$5.95 |
| UACC112 | DC Coiled Power Cord BC 2500 | \$13.75 | UBOK45 | Now You're Talking | \$9.95 |
| UACC130 | CTCSS Tone Board For BC-8500 | \$46.95 | UCHT01 | Color Wall Chart | \$6.95 |
| UACC20 | Universal AC Power Supply | \$7.95 | UCPL63B | Coupler, AM/FM to Scanner BNC | \$11.95 |
| UACC22 | TVR7000 Video Adaptor | \$189.95 | UCTR07 | Optoelectronics 3300 | \$105.95 |
| UACC32 | BP-94 Battery Pack | \$70.95 | UDEMO1 | MD100 | \$159.95 |
| UACC38 | DC Adaptor for Pro-43 | \$10.95 | UDEMO1B | MD100 w/12 volt Battery | \$179.95 |
| UACC39 | MFJ-1282B Commodore Adaptor | \$28.95 | UDEMO2 | MD200 | \$229.95 |
| UACC40A | MFJ-1289 Hi-Res Enhancer 5 1/4 | \$43.95 | UDEMO4 | 1278-T-Turbo (China) | \$350.95 |
| UACC41 | ICOM 8 Pin (MFJ-5084) (USA) | \$9.95 | UFTR01 | MFJ-752C Signal Enhancer | \$73.46 |
| UACC42 | Yaesu 8 Pin (MFJ-5080) (USA) | \$9.95 | UGSM03 | ELF Gaussmeter-Standard (USA) | \$85.95 |
| UACC44 | Kenwood HT (MFJ-5026) | \$9.95 | UHDP01 | Luxury Headset | \$19.95 |
| UACC45 | MFJ-5024 Cable | \$9.95 | URCV01S | Drake R-8 w/VHF Converter Installed | \$1159.95 |
| UACC46 | MFJ-5086 Cable (USA) | \$9.95 | URCV08 | ICOM R72A | \$665.95 |
| UACC47 | Rechargeable AA Batter, 500MA | \$1.85 | URCV23 | Grundig Satellit 700 | \$380.95 |
| UACC48 | BC-72 Desk Charger | \$90.95 | USCN09 | BC200XT | \$209.95 |
| UACC61 | MFJ-1290 Amiga Adapter (USA) | \$35.95 | USCN15C | ICOM R-7100 Blocked | \$1334.95 |
| UACC91 | Pull-out Security Mount | \$39.95 | USCN17S | PRO-43 /Extended Memory30-88 | \$275.95 |

Equipment: Some equipment discontinued; most equipment like new; some slight cosmetic touch or damaged box, wrinkled or marked manual, etc. Full Warranty.

Books: Books have cosmetic damage (bent cover, pages).

Return Policy: All returned items must have a return authorization number issued and clearly marked on the outside packaging of the package. Normal shipping charges will be deducted from refund on all items returned that are not defective.

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Digitech Loop Recorder

Digitalized audio is becoming a staple in the consumer electronics industry. Used in toys, computers, communications and home entertainment equipment, it affords considerable flexibility not available in analog recordings.

The model LR-1400 Loop Recorder from Digitech is an example of how this high technology can be applied to communications. Unencumbered by clunky cassettes or bulky CD drives, this recorder is a chip!

Have you ever had the experience of missing a few key words during reception—perhaps an address, a name, a callsign, or location? How about amateur communications when a brief CW message zooms past—did you ever wish you could hear just that quick transmission over again? Now you can.

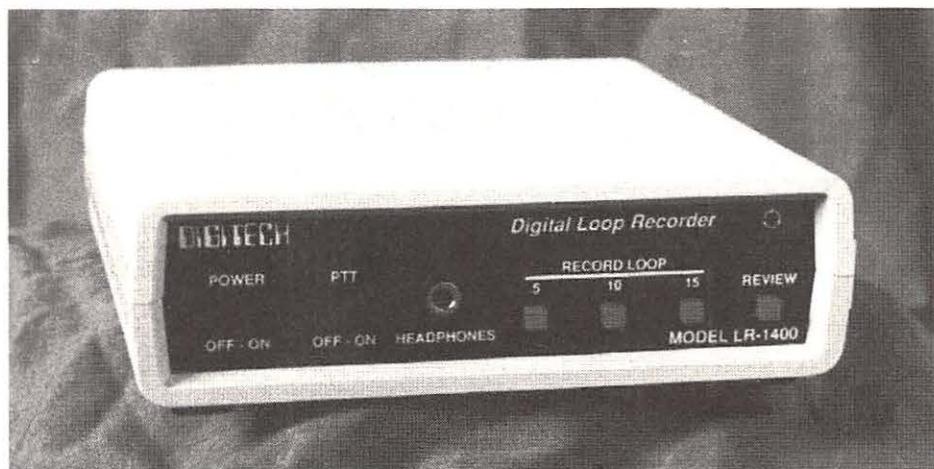
For VHF/UHF applications, the digital loop recorder is a dandy way to preserve data bursts for later demodulation, to catch unexpected CW repeater IDs for replay and callsign identification, or for unattended recording of a rare transmission on a monitored frequency for later playback and identification.

For signal intelligence work, transmissions may be digitally stored and repeatedly played back for decryption or other analysis. More practical for hams, however, would be its use for recording "CQ" and callsigns for Field Day or other contests.

The LR-1400 cleverly connects to any audio output—earphone, recorder, or external speaker jack—on your receiver, scanner, or transceiver. It has its own internal speaker, but a jack is provided to interconnect with a better accessory speaker if so desired.

Its small footprint (5.25" square and only 1.5" high) can find a spot in any radio installation and, at only 16 ounces, it's a lightweight as well.

Operating as a full-featured, microproces-



sor-controlled, digital, continuous loop recorder, the Digitech LR-1400 can be pushbutton-activated to record 5, 10 or 15 seconds worth of audio, then played back any number of times. The contents of the message are stored in non-volatile RAM; even with power disconnected, the message audio will remain indefinitely—until overwritten (recorded over).

There is even a rear-panel provision which allows the message to be repeated over and over—endlessly, if you are a masochist. Frequency response is 100-3400 Hz, making voice and data the primary application.

Other rear-panel provisions include a volume-adjustable, line-level (0-400 mV) output for feeding the recorded audio to other equipment (transmitter, recorder, PA system, etc.); a mike input (60 mV nom.) for custom audio recording; a source audio input (1.25 V P-P) and a 12 VDC power jack (AC adaptor is included). You can even remote-key a transmitter or transceiver with the push-to-talk circuit which sinks up to 800 mA (positive open-collector circuit).

Headphone operation is also available from a front-panel 1/8" (3.5 mm) jack; a two-watt, volume-adjustable amplifier provides more than enough power to drive the internal or an 8-ohm external speaker. A miniplug patch cord is provided.

Operating the Unit

By connecting the patch cord to any audio source, the high-impedance input of the 1400 will pick up audio and transfer

it to memory without depriving the original audio line of measurable power. A choice of 5, 10 or 15 seconds worth of sampling time is selected by the appropriate front-panel pushbutton. When it is time for a playback, a press of the review button dumps the audio contents into the speaker.

We tested the 1400 on a Drake R8 shortwave receiver and an ICOM R7100 VHF/UHF receiver. The digitized audio recovery was of the highest quality, and the sound from the little internal speaker was more than adequate for the undemanding task of "instant playback."

Although the unit has to be manually reset to make one recording cycle before it can write a new message, or if you change recording time (5, 10 or 15 seconds), this procedure quickly becomes routine.

The LR-1400 Digital Loop Recorder is available for \$129.5 plus \$6 shipping from Digitech Concepts, 966 70th Avenue, Roberts, Wisconsin, 54023; or call 715-749-3960.

Specifications

| | |
|----------------------------------|----------------------------------|
| Record Loop Times | 5, 10, 15 seconds |
| Play Back Modes | One shot or continuous |
| Memory Type | Non Volatile |
| Frequency Response | 100-3400 Hz |
| Audio Out Level (low) | 0-400 mV Adjustable |
| External Speaker Impedance | 8 Ohms |
| Source Audio Input | 1.25 V P-P Max |
| Microphone Input | 60 mV Typical |
| Keying | Positive Open Collector (800 mA) |
| Power | 12Vdc Adaptor Provided |
| Dimensions | 1.5"x5.25"x5.25" |
| Shipping Wt | 1 lb |

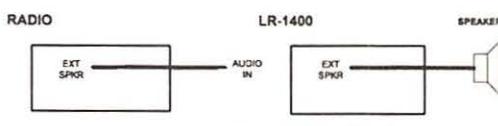
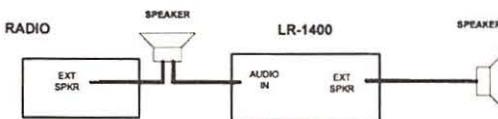
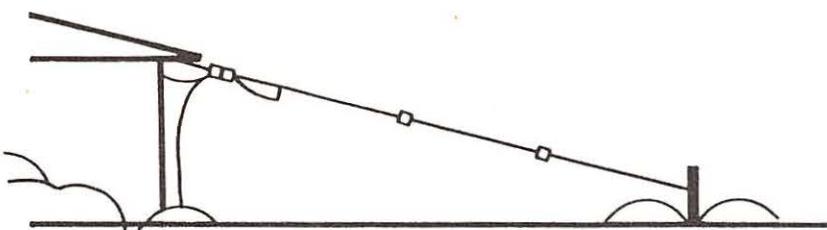


FIG. A. SOURCE AUDIO MUTED DURING PLAYBACK



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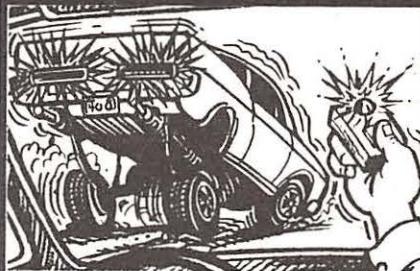
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Bolong HS-490

Just when you thought "Made in China" was fading away from the shortwave scene, along comes another Chinese radio. This latest example of Asian engineering is manufactured by a joint venture between Xin Hui Electronics and Shanghai Huaxin Electronic Instruments. Called the Bolong HS-490—and probably sold under various other names, as well—it sells in Beijing shops for around the equivalent of \$42. It's a fairly new model, so it should be showing up on our shores before long.

Fairly Full Coverage, but Limited Tuning Aids

The compact '490 is digitally synthesized, being tuned by ten memory presets for shortwave, with another ten presets for AM and FM. The only other tuning aids are multi-speed up/down slewing and by-frequency scanning. There's no keypad or tuning knob.

The '490 covers the AM broadcast band, FM, plus shortwave from 2.3-6.2 and 7.1-21.85 MHz. FM is in stereo through earbuds, which come standard with the radio, but only mono through the speaker.

Normally, shortwave frequencies display in either the XXXXX kHz or XX.XXX MHz format. However, the '490 shows the tuned frequency as XX.XX MHz for even-numbered channel (e.g., 11850 kHz appears as 11.85 MHz) or XX.XX5 MHz for odd numbered channels (e.g., 11855 kHz appears as 11.855 kHz). That's an annoying oddity found almost exclusively on Chinese-made sets, but you get used to it quickly enough.

AM Tuning Lacking

In the Americas, AM stations are spaced 10 kHz apart; elsewhere, that spacing is 9 kHz. With the '490, AM channel spacing is permanently set at 10 or 9 kHz, depending upon where in the world the radio was meant to be sold. This means that if you travel where the spacing standard is different, you'll have trouble receiving at least some of the stations on that important band. A related drawback is that the set doesn't cover the new



1615-1705 kHz expanded AM band. In the United States, this long-awaited band expansion is scheduled to take effect shortly.

Few Tuning Aids

The radio's ergonomics are okay, although you'll miss such tuning aids as a keypad. The limited number of tuning options means that you'll need to cultivate your resources of patience if you expect to tune this radio often. However, it tunes only in 5 kHz increments, which makes channel-by-channel tuning handy for any but the relatively few stations which operate significantly off channel. Even these offbeat frequencies are audible, though, as the radio's sole bandwidth is wide enough to capture them.

A small point is that, unlike most cheap radios, the '490 comes with a telescopic antenna which rotates on its swivel. This allows it to be properly angled when you lay the radio down, plus it means that the antenna is less likely to break when hit accidentally.

There's also a lock switch. However, another oddity found only on Chinese radios—apparently designed by folks with little "real-life" understanding of shortwave—is that it doesn't work as a power lock to prevent the radio from switching on accidentally in transit. If you're stuffing this radio away in your suitcase, be sure to remove the batteries first. (However, for air travel keep those batteries within easy reach, as you may have to prove to suspicious security personnel that the radio actually works.)

UTC Clock Shows when Radio Off

The '490's World Time clock is helpful, especially as it is tied into an alarm/sleep timer. Yet, that clock doesn't give the time when the radio is on, which is when you really need it. The radio has an illuminated display, which is unusual in this price class, and an AC adaptor—also rare at this price, and very useful—but no signal-strength indicator.

Pedestrian Performance

How well does the '490 perform?

To begin with, selectivity is mediocre, although it's just a bit better than the norm for "el cheapo" models. Its audio quality is similarly uninspiring, but adequate. But there's nothing adequate about its low-cost single-conversion IF circuitry, which generates obnoxious images (false "repeats") of signals 900 kHz higher.

Newcomers to the testing of shortwave radios tend to dial around to see whether the radio being checked out can pick up a station another radio can't, or pick it up better. Trouble is, nearly any radio can pick up a few stations better than nearly any other radio, so by using this approach nearly any radio can be made to seem better than nearly any other radio.

The proof of overall performance, then, is not how a radio performs in a single given situation or variable in order to justify one's purchase. Rather, it is how the radio performs under a wide variety of reception conditions.

For worthy overall performance, single-conversion radios just don't hack it. True, you can find any number of channels where image interference won't rear its head. But you can also find a number of channels that are significantly degraded by this form of "ghost" interference.

At the '490's price, you don't expect to find multiple conversion IFs. But you also have to be prepared to put up with reception that is not so clear as it would have been had the radio been equipped with double conver-

sion. Grove, MFJ, and other firms offer tunable devices to help reduce images, but these really aren't practical for walkaround portable operation.

The '490's sensitivity to weak signals is about average for a low-cost digital radio. To help in this regard, the radio comes with a passive tape-measure-type outboard antenna, an accessory ordinarily found only on more-costly models. Even then, this is no DX device—and may not even satisfy sophisticated West Coast listeners for listening to major stations.

The radio's dynamic range is in the same okay league, being adequate for use pretty much anywhere in the world—provided a significant outdoor antenna isn't used. FM reception is also uninspiring, having little in the way of selectivity and only a "so-so" capture ratio. Additionally, the stereo function on FM doesn't work—at least on our unit.

Overall: Inexpensive, Basic, but Reasonable Value

In all, the new Bolong HS-490 is your basic low-cost digital portable, but with more features and accessories than you would expect for the price.

It's hard to imagine many *MT* readers using it as their main receiver. However, for traveling, you don't want something so costly that you're afraid that it might be stolen or lost. For this, the Bolong makes good sense—provided listening to the AM band isn't important to you.

How do you obtain a Bolong, short of going to China? Chances are that it is, or shortly will be, sold in North America under that name or some other designation, and the price should not be all that much greater than it is in Beijing. Use our photo of the radio as your guide, and remember that whoever imports it may or may not sell it with the full compliment of accessories we found.

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"Ladies and Gentlemen, Place Your Bets" HOKA Code 3 and Code 30 vs. the PK232

Last month we took our first look at the long awaited HOKA Code 30. See last month's column for hardware requirements and installation details. This month we'll add to our knowledge of the Code 30 and compare it to its little brother, the Code 3, version 5. We'll continue to use a PK-232MBX (with the latest ROM upgrade) as the base for decoding comparisons.

First, I'd better tell you the price of the Code 30, which I just discovered from its US distributor. Hold on to your hats: This baby comes in at around \$2795. "Where do you put the decimal point?!" I asked, when told the price.

HOKA 30 takes the dubious distinction of being the highest priced product to be reviewed in this column. Even its little brother, the version of Code 3 we used, weighs in at a hefty \$795. Now let the race begin. *"Decoders to your gates!"*

At the gate, the \$350 PK-232 is in the fast lane, since it has its own self-contained microprocessor and only requires the PC for display and command entry. The HOKAs use the PC's micro for the majority of the control and processing. Therefore, the PK can be used inside programs such as Scancat, Scorpio and Ham Windows, while the HOKAs cannot since they tie up the PC themselves.

The Code 3 is contained in a neat little plastic box (Fig 1). All that has to be connected is: 110 vac, audio via an RCA jack, and serial connection to the computer via connection of the 9 pin DIN. This differs from the Code 30 which had no external "box," but required the installation of an expansion card inside the computer.

The software installation and running procedure is very similar to the Code 30—even

FIGURE 1



with the same poorly conceived (from the user's standpoint) copy protection scheme. Once again, the time consuming PC calibration is required (see last month). According to HOKA the major difference between "3" and "30" is that 30 uses digital signal processing hardware, while 3 uses conventional analog circuitry. Can we "see" a difference? How do they compare to the PK-232MBX in decoding real-world shortwave signals? Let's see.

The track: For this review we used frequencies supplied by HOKA and their USA distributor plus our own database. The total amount of decoding time which went into this review exceeded 110 hours spread over two and one-half months and on different days and times. With the exception of the physical location, this should represent typical conditions.

"At the first turn—ease of use, it's HOKA 3 leading by a key." Code 3 is manipulated via menu screens and "F" keys. The basic operation is very simple and requires almost no user intervention. Simply press F1 which brings up the Measurement Shift-Baudrate screen shown in Fig 2. Tune your receiver so that the peaks are on each side of the zero (middle) of the horizontal line. When the baud rate in the upper right corner stabilizes,

press F3 and the classification of the signal will begin, as shown in Fig 3.

If the program can figure out the type of signal you are tuned to, it will indicate it at the bottom right of the screen along with its confidence level and tell you to hit enter. The decoding screen is then displayed as shown in Fig 4. On medium to strong stations it's as good as any other decoder. But it's also very quick and foolproof.

"As they head for the next turn..." On weak signals the Code 30 was significantly better than the 3 and even better than the PK-232MBX. For overall weak signal handling the 30 is in the lead with the PK right on its tail. The 3 is a few lengths behind the pack.

For sheer horse power (*ouch!*), the HOKAs are showing their muscle with the PK fading. There is no question that the HOKAs' potential for decoding different types of signals is nothing short of phenomenal. Fig. 5 shows two-thirds of the signal types that 3 can decode. As an analysis instrument—displaying signals and analyzing their audio structure—HOKA leaves the rest in the dust. But, how many signals are encrypted and still cannot be read after decoding? How many of these different decoding modes will be used or be usable, more than 10% of the time? Winning a battle is not the same as winning the war—or the horse race.

"As the decoders enter the final turn the Code 30's muscles are rippling, the Code 3's strides are effortless, but the PK-232 is coming on fast." After over 100 hours of testing and countless "Yes, I'll be down for dinner in just another minute," the findings are surprising, even to me.

First, let's define the term "decode," so we are speaking the same language. To decode a signal type means to understand *how* the information is put on the radio signal. At this, HOKA 30 and, to a lesser degree, Code 3, have no peers. However, increasingly, the information that is put on the signal is encrypted *before* it goes on. So in this case, decoding the signal type still results in non-readable text.

The surprise was that after tuning in over 200 different signals with mainly the Code 30 and the PK-232, there was NO difference in the number of "understandable" signals which resulted! The Code 30 easily identified about

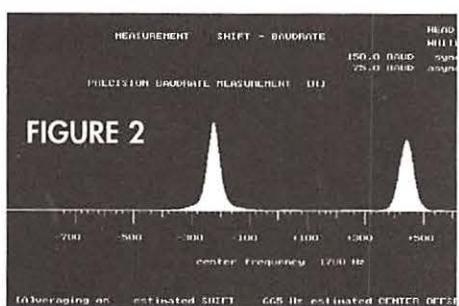


FIGURE 2

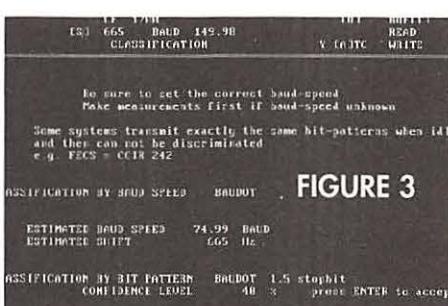


FIGURE 3

GALLI
 011CS
 4111 ^
 CF 1700 (MT)
 (S) 665 BALD 75.00
 176-2 86.0K 0 < x D
 RND
 WHITE
 wdi sa 1500 auto:e25:bka 9.1 212/15/02/2100:xx 2018
 96em7(0004)-
 wdi sa 1500 auto:e25:bka 9.1 231/18/16/2501:xx 8803 73km:
 g.t sa 1400 30 set 15 220/12/2-3215/01B:sc1 56933?
 web sa 1300 30 set 15 223/11/6-3211-019:sc1 tec emd4 216113?
 whd sa 1500 16 set 12 214/15/22015/01B:sc1 2011 7011?
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FIGURE 4

ten signals in which the PK either had trouble deciding on the mode, or required retuning using the Code 30 screens. But even the Code 30 still did not produce understandable text. Do you fancy yourself an amateur code breaker? You have a better, and more profitable, chance at hitting the lottery. Therefore, although the mode was identified and being decoded, it still resulted in no message information, calling into question the value of the extra modes. *"So as we head for the wire the field is all bunched up!"*

"And At The Wire It's ..."

As with most things in life there are no panaceas; no perfect answers. What happens at this finish line depends more on you and your needs or wants than the decoders. They are all excellent and have their different strengths and weaknesses.

"The Code 30 has so much muscle it has decided to run past the wire and go for another lap." There is no question that the Code 30 can do things that other decoders cannot. Such as, put you into personal bankruptcy at \$2795! Code 30 is not a decoder, in my opinion. It is a signal analysis tool more fit for the environment of a government SIGINT agency. For me, and I think for most, the price/usefulness ratio is much too high.

The Code 3 has many of the most used features of the Code 30 and is almost a quarter of the price. But at \$800 I believe it is still over-priced, although—relative to hardware based decoders—it may not look like it. That's because Code 3 uses the already purchased hardware of your PC. Both HOKAs' strengths are in their software, and to my mind \$800 is still much too high for what is basically software. If the Code 3 were \$400 dollars it would sweep the decoder market, and should still make a handsome profit for its software authors.

"Uh-oh ... Code 3 just stumbled mid-stride ..." We found that the Code 3's manual and screen instructions do not quite match reality. For example, in the installation of 3, the screen tells the user to run CODE 3. When you do this you get an error message and the program does not load. We found the only

way to start the program was to run CODEUS.

Clearly, this is just a fact of the product being in transition and evolving, as all good programs will. This is further indicated by the difference of version numbers on the disk (v5) and on the manual (v4). But for this kind of money one would expect a correct manual.

We found other instances of problems in the manual which ranged from making working copies with the insane copy protection scheme which HOKA insists on putting on the 3 and the 30, to trying to access an option (the Synop decoding model) which was supposedly included but wasn't.

As for the PK-232MBX, it keeps chugging along. Yes, it has a limited number of decode modes. However, I guess it decodes close to 90% of the "understandable" signals on shortwave. It has very good weak signal capability; can be used inside monitoring software standards like ScanCat, making for a nearly total monitoring environment; is useful to SWL/HAMs by providing transmitting mode capability. And, finally, it costs around \$350.

Post Race Show

If you are a real utility signal chaser and get a kick out of identifying modes (admittedly, of some significance), even if you can't understand the communications—if you have money left over after you take care of your family, community obligations, and doing your part for the welfare of humanity—then the Code 30 is for you. Or, if you are a small country with a limited surveillance budget, you should buy several Code 30s.

The Code 3 is also a very fine product. As with the Code 30, it is still going through growing pains, so don't expect letter-perfect instructions, documentation, or operation. At \$795 the 3 is \$2000 cheaper than the 30 and puts it into the range of the Universal, AEA DSP, and other European decoders, compared to which, it probably provides the best value. The people at HOKA are to be commended for taking so much of what was hardware and reducing it to software. This approach allows for ease of updating and

FIGURE 5

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| AUTOSPEC | | SYSTEMS 1 | | C) | |
|----------|---------------|---------------|-------------|------|--|
| ARQ-6 | 7B | HAUDOT | F7B | 2 CH | |
| ARQ-6 | 98 9B | TWINPLEX | | | |
| ANQ-E | ARQ 1800 E | FEC | CCIR 625 E | | |
| ANQ-E3 | CCIR 519 | FEC-8 | CCIR 1800 | | |
| ANQ-S | ARQ 1800 S | HFC | CCIR 1800 S | | |
| ANQ-SUE | | HNG-FEC | opt. | | |
| ANQ-POI | | HOL-FEC | opt. | | |
| DUP ARQ | OTRAC | PICCOLO MX U1 | | | |
| ANQ | CCIR 625 A | COQUILLE 8 | opt. | | |
| HC-ANQ | opt. | COQUILLE 13 | opt. | | |
| TORG 10 | / 11 | TDM | CCIR 242 | | |
| SITCOR | CCIR F25 AUTO | TDM | CCIR 342 | | |
| FACTRET | RADIO AX-25 | FACTOR | mode 1 - 4 | | |

improvements while minimizing parts and hardware inventories. It also results in a major cost benefit. Unfortunately, HOKA has seen fit to pass on only a small portion of this economic benefit to the buyers.

Price aside, the HOKAs performed very well, but not for my everyday monitoring; They cannot be used with my favorite software. It was always—Get out of the receiver control and database program. Start the Code 30. Decode. Stop the Code 30. Start the receiver control program again—Not very convenient! But as a tool for analysis they are great. It's like working on a circuit and having that big old Tektronix oscilloscope on the bench for those tasks that the multimeter cannot do alone.

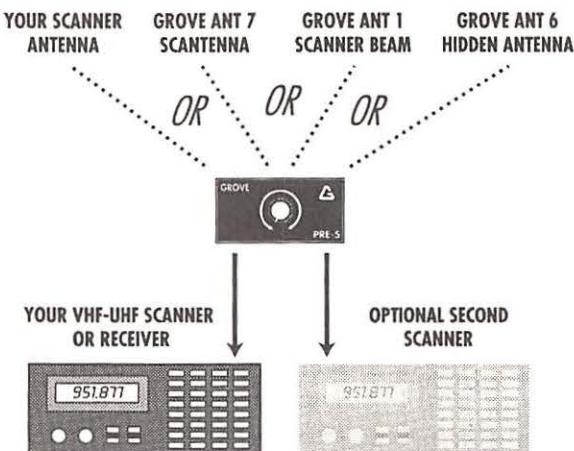
The US distributor for HOKA products is Computer Aided Technologies, P.O. Box 18292, Shreveport, LA 71138, Tel 318-636-1234. Check their ad in *MT* for latest versions, options and prices.

We have a lot of new software in the queue for discussion in coming columns. Don't forget to drop me a line if you come across an interesting computer/software product. Our horse-racing theme reminds me of an old saying by my wife's mother: "The person who does not bet never loses." Pretty good advice for these times.

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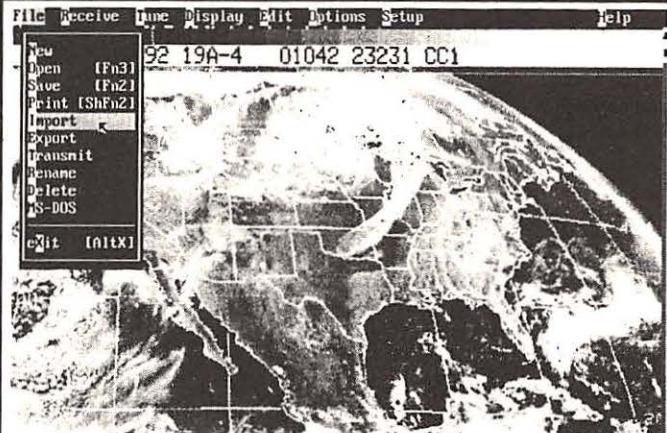
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External Coupling to Broadcast Band Receivers

In a past issue of *Monitoring Times* (Sep 93), I described a method for resonating short wire antennas by means of a ferrite loop from a junked transistor radio. This involved placing the loop antenna in series with a 365-pF variable capacitor and inserting this inductance and capacitance between the receiver antenna jack and the end of a random length wire. The system was then tuned to resonance at the listening frequency (550-1600 kHz), which resulted in a sharp increase in signal strength (10 dB or more).

Donald Kidder, an *MT* reader from Maine, wrote to tell us of a scheme he uses to couple short wire antennas to AM BC-band receivers that do not have an antenna jack. The same coupling system is used to resonate a short piece of wire (less than 1/4 wavelength at the frequency of interest) which is used as an antenna. The details are provided in Figure 1.

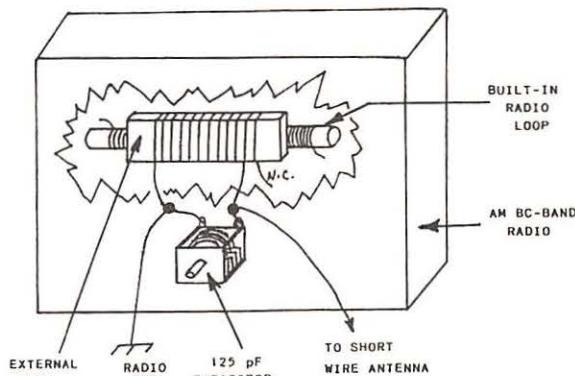
A ferrite BC-band radio loop antenna is placed near the built-in loop of the radio. Through mutual (inductive) coupling, the signal energy from the resonating loop is transferred to the internal ferrite loop of the BC-band receiver. The closer the two loops are to one another, the greater the degree of coupling.

Other Applications

The general technique shown in Figure 1 is also useful for coupling a preamplifier to a BC-band radio that has no antenna jack. The addition of a preamplifier can enhance weak signal reception when you are logging DX stations in the standard broadcast band. A circuit that illustrates a preamplifier and its coupling method is presented in Figure 2. The amplifier has a signal gain of approximately 10 dB.

Yet another application for loop mutual coupling makes it possible for a shortwave listener to use an existing AM BC-band radio to monitor high-frequency AM broadcasts. In this instance an HF-band converter utilizes the external loop of Figure 1 as its tuned circuit (intermediate frequency) at the output of the preamplifier. This tuned circuit is coupled to the loop within the receiver, which makes the overall system a double-conver-

FIGURE 1



Most of the parts for the ideas presented here can be gleaned from junked transistor radios.

sion superheterodyne receiver.

The converter and BC-band receiver must be enclosed in a metal shield box when this is done to prevent unwanted pickup of AM BC-band stations that would otherwise appear as QRM among and on top of the HF-band signals. The shield box should be connected to an earth ground for best results. A simple converter circuit is given as an example in Figure 3.

Signals are tuned in by adjusting the main tuning dial on the BC-band receiver. This provides a tuning range of 1.15 MHz in any shortwave band.

The major inconvenience associated with this technique results from the operator's need to repeat the converter output tuned circuit for maximum HF signal response each time the BC-band receiver dial is changed. The same is true of the preamplifier in Figure 2.

Gimmick Coupling to Loops

Attaching an external end-fed wire antenna to a BC-band receiver that has no provisions for an external antenna is a difficult and frustrating task. The simplest practical method calls for placing the end of the antenna near the built-in loop antenna. One to three inches of the antenna wire can be taped to the internal loop. Alternatively, the end of the antenna can be wrapped

once around the built-in loop.

The free end of the coupling wire (inside the radio) should not be grounded. Rather, it is left floating to ensure very light coupling. This has long been known as "gimmick coupling." If the coupling is too great, a myriad of unwanted short-wave signals will appear across the tuning range of the BC-band radio. This is because the nonresonant wire responds to signals from LF to VHF. The typical mixer/oscillator stage in these radios can't discriminate against strong HF signals because the oscillator is rich in harmonic energy, allowing the mixer to respond to high frequency energy above the standard BC band.

The rule is to use only the degree of coupling needed to increase the BC-band signal strength without allowing spurious HF signals to appear in the receiver output.

Some Final Thoughts

This article is written to encourage experimenting among those of you who stay up late to log distant AM BC-band stations. There are times when even the simplest, low-cost BC receiver can deliver amazing performance if it is used with an external antenna. Most of the parts for the ideas presented here can be gleaned from junked transistor radios. All you need is some wire and solder to carry out your experiments.

Donald Kidder mentioned in his letter that velcro strips are handy for connecting the two ferrite loops together when using the circuit in Figure 1. He also reported being able to copy Boston during the day from his Ashland, Maine, home (roughly 350 miles) while using the arrangement in Figure 1.

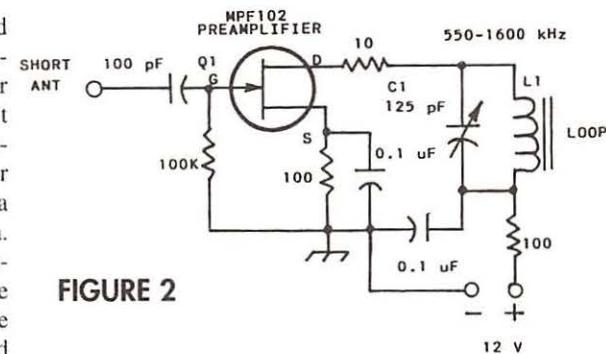


FIGURE 2

When using the converter described in Figure 3 it is important to understand that 11 MHz signals will appear when the BC-band radio is tuned to 550 kHz. You will hear 9.95-MHz signals at 1600 on the radio dial. WWV broadcasts on 10 MHz will appear at 1550 on the tuning dial.

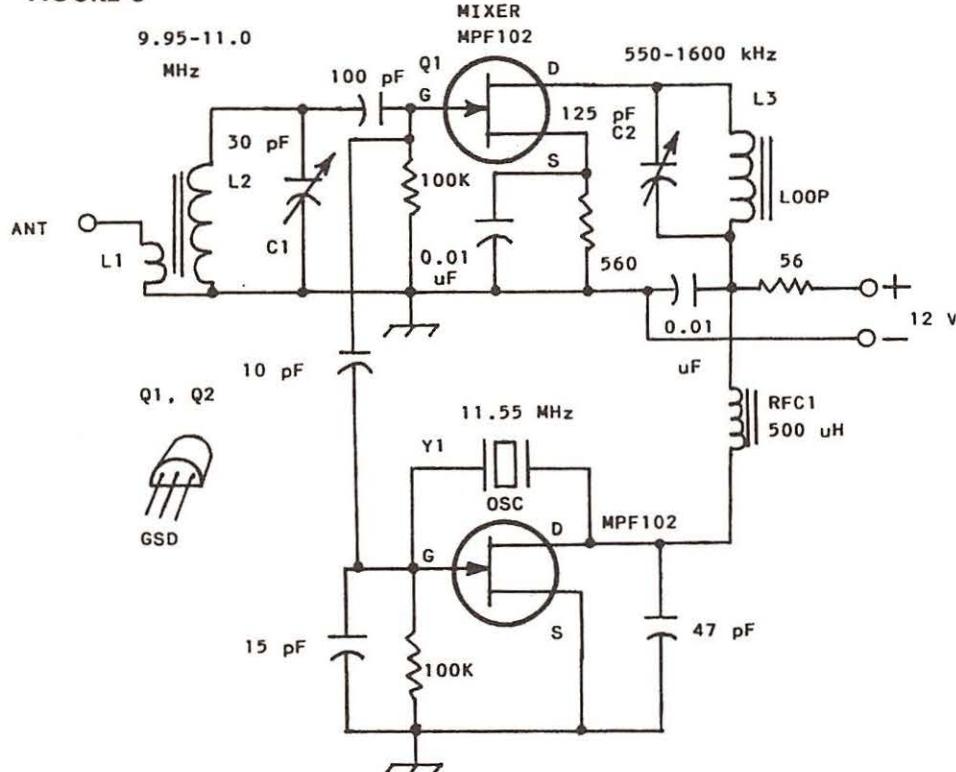
JFETs other than the MPF102s will work fine in the circuits of Figure 2 and 3. For example, you may use 2N4416s or 40673 MOSFETs. If the latter type are employed, simply tie gates 1 and 2 together to make the hookup the same as for an MPF102.

In all three circuits it is necessary to place the external ferrite loop antenna near the loop

in the BC-band radio. The preamplifier and Figure 1 circuit may be situated outside the BC-band radio cabinet if the latter is made of plastic. However, proper signal transfer will occur only if the two ferrite loops are close to one another and in parallel.

The small variable capacitors taken from junked BC-band receivers may be used for C1 of Figure 2 and C2 of Figure 3. These are two-section capacitors. The smaller section usually has 75-pF of capacitance, so use the larger section for these circuits. The Figure 2 and 3 circuits will operate satisfactorily from a 9-volt transistor-radio battery if a 12-volt power supply is not available.

FIGURE 3



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Low Pass Active Filter for CTCSS Detection

Let's vacation from the digital side of radio this month for a side trip back into the analog world where I've got a circuit for you that'll knock your socks off. For about five bucks in parts and practically any old frequency counter, we'll detect and read out CTCSS frequencies! CTCSS (*Continuous Tone Coded Squelch System*) uses "sub-audible" frequencies for control and recognition purposes. If you check the catalogs, you'll see that even the simplest digital readout CTCSS tone decoders start at \$200 and go on into the four figures.

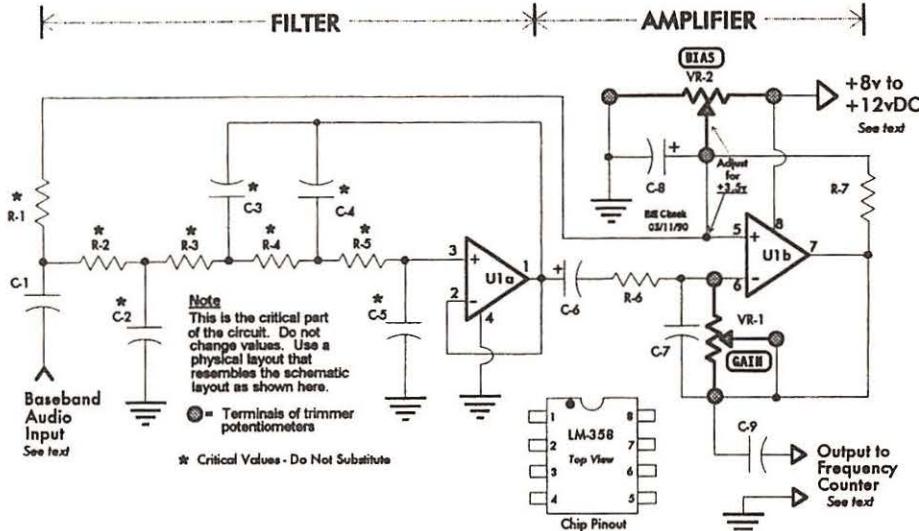
Our \$5 Low Pass Active Filter and Radio Shack's \$100 frequency counter, #22-305, will give you all the CTCSS detection capability you'd ever hoped for, not to mention a passable frequency counter for other applications around shop and shack. You might be able to use Radio Shack's new multimeter with PC Interface and 20-MHz frequency counter, #22-168, if it has 1 Hz resolution (last year's model didn't). Most any frequency counter will do, including the roll-your-own varieties, if it has 1-Hz resolution.

VHF-UHF radio receivers, including garden variety scanners, are capable of detecting CTCSS tones, but decoding them is another matter. Scannists who want to use CTCSS to identify or selectively choose the signals to be intercepted, first need to be able to distinguish between the 32 or more CTCSS tones that are in common use. Our Low Pass Active Filter makes the effort painless and cost effective.

A CTCSS tone is broadcast simultaneously with the normal voice signal, but you'll rarely ever hear or notice it because most receivers audio circuits are designed for the voice band of 300 to 3000 Hz. The receiver audio circuits do not amplify and pass CTCSS tones. You can sometimes detect CTCSS tones underlying scanner voice signals by recording the signal with a high fidelity tape recorder and playing it back through a hi-fi system. CTCSS will show up as an annoying bass tone. The problem is how to detect the CTCSS tones and display them on a frequency counter without interference from the voice signal. It is much easier than you might first guess.

The voice band of 300-3000 Hz in most receivers is achieved by special bandpass filters in the audio preamplifier and volume control sections which reject all frequencies

LOW PASS ACTIVE FILTER FOR CTCSS



below 300 Hz and above 3000 Hz. The trick here is to intercept and acquire the Baseband Audio Signal at a point *before* it goes into the receiver's audio bandpass filter stage.

No problem....just go to the detector/discriminator where the freshly detected audio signal is at full bandwidth, equal to the passband of the receiver's last I.F. section (usually about 15-kHz in most scanners, but not less than 6 kHz in even the best ones). At this point in the receiver, the audio signal contains **everything**, from CTCSS tones to noise, to voice signals, to you-name-it. Attach a frequency counter to the output of the detector/discriminator and it will go hawg-wild trying to display everything that's there. So what to do?

"Just" filter out the noise and undesired bandwidth to leave only the small CTCSS slice of audio spectrum—about 40 Hz to 250 Hz, give or take. Years ago, that prospect was either impossible or costly beyond measure. Thanks to the development of the required operational amplifiers (op amps) on fifty-cent IC chips, the job of sharply filtering a desired pass band becomes as easy as a trip to the parts house or a call to your favorite mail order supplier.

The heart of our CTCSS Decoder/Display project is the frequency counter, of course, but the **brain** of the project is the simple Low Pass Active Filter that can be whipped up in

less than an hour if you have everything handy. The circuit is a 3-pole Butterworth active filter (for those who care, and for those who don't, it is a modern, high performance method of precisely shaping a desired passband). Our Low Pass Filter is designed to pass frequencies from just above DC to about 250-Hz or so with 300 Hz as the top limit.

When the Low Pass Filter is connected to the output of your receiver's Detector/Discriminator, it will completely reject voice signals and above, but will allow the "subaudible" signals, such as CTCSS to be passed and amplified for easy feed to an external frequency counter. If a CTCSS tone is present in a signal, the frequency counter will lock onto and display that tone with an accuracy of 1 Hz or so. Since CTCSS tones are spaced about every 3 Hertz between 67 Hz and 203 Hz, you'll not have any trouble determining which tone is displayed at any given time.

The active part of the circuit is the LM-358 dual op amp, readily available in 8-pin, DIP packages for construction on perfboard. You can also use the LM-324 quad op amp, 14-pin DIP (Radio Shack, #276-1711), but the pinouts will differ from those shown in the diagram here, obviously. My prototype uses the LM-358 on a perf board about 1" x 2" with room to spare. Your layout should remain fairly faithful to the physical layout of the sche-

TABLE 1: NFM Discriminator Baseband Audio Pins

| SCANNER | SYM | NFM CHIP | PIN # |
|--------------|--------|------------|-------|
| PRO-2004/5/6 | IC-2 | TK-10420 | 9 |
| PRO-2032 | IC-2 | MC-3361 | 9 |
| PRO-2030 | IC-3 | NJM3359 | 10 |
| PRO-2027 | IC-2 | MC3361N | 9 |
| PRO-2026 | IC-7 | NJM3359D-A | 10 |
| PRO-2022 | IC-1 | MC-3361N | 9 |
| PRO-43 | IC-301 | TK-10427 | 9 |
| PRO-39 | IC-201 | MC3361N | 9 |
| PRO-37 | IC-101 | MC3361N | 9 |
| PRO-35 | IC-401 | TK10421M-2 | 11 |
| PRO-34 | IC-101 | TK10420 | 9 |
| BC760XLT | IC-2 | NJM3359D-A | 10 |
| BC200XLT | IC-401 | TK10421M-2 | 11 |
| BC560XLT | IC-1 | NJM3359D-A | 10 |
| BC800XLT | IC-1 | MC-3359P | 10 |
| BC855XLT | IC-401 | TK10421M-2 | 11 |
| BC890XLT | IC-3 | NJM3359D-A | 10 |
| BC2500XLT | IC-201 | TK10930V | 12 |
| BC8500XLT | IC-9 | MC3361BP | 9 |
| MR8100 | IC-3 | NJM3359D-A | 10 |
| Shinwa SR001 | A-502 | MC3357 | 9 |
| Icom R-1 | IC-1 | TK10487M | 12 |

matic diagram. Use simple point-to-point wiring on the bottom side of the perfboard and few, if any, jumpers will be needed.

Construction is not critical, but try to keep the input area separate from the output. Do not substitute parts, especially the critical ones. Resistors should be as small as possible, 1/4-watt or less, either carbon or metal film types. Capacitors, with exception of C6 and C8, should be of the monolithic style, small as possible. Ceramic disk capacitors will work but are not as neat or as small as the newer monolithics. C6 can be an electrolytic, but tantalum is always preferred as a spectrum coupling device.

An IC socket is highly recommended for the op amp so the chip can be easily replaced if there is a serious error in your work. Trimmer potentiometers are not critical, but the 10-turn precision types are best. The important thing is that their adjustment screws be accessible after the board has been installed.

Installation

Install the Low Pass Filter somewhere convenient in the receiver; location not critical. First wire the ground traces on the Filter to ground in the receiver. Then connect the DC power lead from the Filter to a source of +8v to +12v in the receiver. For the PRO-2004/5/6 series, a good place is the +8.2v supply located at the emitter of Q-32. Next, with power applied to the Filter, attach a voltmeter between

ground and Pin 5 of the LM-358 (or to the wiper arm of VR-2) and adjust VR-2 (BIAS) for a reading of exactly +3.50 volts. This sets the bias on the LM-358, which need not be readjusted again, unless the voltage supply is changed.

Connect a wire from the input of C-1 to the Baseband Audio point in your receiver. If the input of the Filter is located more than two or three inches from the Baseband Audio point, then use a mini coax or shielded mic cable to make the connection with the shield of the cable grounded at each end. The Baseband Audio signal will usually be found at a pin on what we call the *NFM Discriminator chip*, a version of which is used in all modern VHF-UHF receivers.

Solder directly to this pin (the chip is rugged) unless you find a better place. Refer to Table

I for a guide to the more popular scanners, the relevant NFM chip, and Baseband Audio signal Pin in each. If your receiver is not shown in Table 1, then get a service manual and schematic for your receiver and scrutinize it for one of the chips shown in Table 1. While the list of receivers is certainly not comprehensive, the list of NFM chips used is. If your receiver predates these "receiver on a chip" chips, you will have to find the FM detector—usually a discriminator—and tap its output.

Drill a 1/4" or other appropriate hole in the rear panel of your scanner and install an RCA

**TABLE 2:
Parts List**

| SYM | Description/Value | Note |
|-------|--|------|
| U-1 | LM-358 Dual OpAmp, 8-pin DIP | |
| C-1,9 | Capacitor, 0.01- μ F, monolithic | |
| C2-4 | Capacitors, 3300-pF (.0033- μ F), mono * | * |
| C5 | Capacitor, 220-pF, monolithic | * |
| C6 | Capacitor, 0.47- μ F, tantalum | |
| C7 | Capacitor, 470-pF, monolithic | |
| C8 | Capacitor, 10- μ F, electrolytic | |
| R1,2 | Resistors, 1-meg | * |
| R3,5 | Resistors, 470-k | * |
| R4 | Resistor, 560-k | * |
| R6 | Resistor, 10-k | * |
| R7 | Resistor, 150-k | * |
| VR-1 | Trimmer Potentiometer, 1-Meg | |
| VR-2 | Trimmer Potentiometer, 47-k | |
| Misc | Perf board, solder, 22-30ga wire, mounting hardware, etc | |

* Critical values - do not substitute

**TABLE 3:
CTCSS Resources**

CTCSS Decoder/Controllers

Communications Specialists, Inc.
426 W. Taft Avenue
Orange, CA 92665-4296
(800) 854-0547

Selectone
23278 Bernhardt St
Hayward, CA 94545
(800) 227-0376 or (415) 887-1950

Active Filter Design Information
Active Filter Cookbook by Don Lancaster
Synergetics
Bob 809
Thatcher, AZ 85552
(602) 428-4073

Please tell these suppliers they were mentioned in Monitoring Times.

phono jack, BNC jack, or other standard jack of your preference. Prepare a shielded coaxial cable (RG-58 will be just fine) with appropriate connectors on each end to go between your receiver and frequency counter. You could even use a Radio Shack audio patch cable with appropriate adapters on each end!

To start up, tune to a frequency where the user(s) are known to employ CTCSS. When a signal comes in, observe the frequency counter. If a stable CTCSS reading between 65 Hz - 205 Hz is not displayed within 2-5 seconds, adjust VR-1 (GAIN) either way until the frequency counter locks onto the signal. Do not use any more gain than necessary to lock and display the CTCSS frequency.

If you know what you're doing and have the right equipment, you can inject a 100 Hz tone into the INPUT of the filter and use an oscilloscope or AC voltmeter to detect the output and adjust VR-1 for a reading of 250-mV to 1-volt, max. This is not a critical operation, and once set, the gain usually needs no additional tweaking.

That's about it, folks. The Low Pass Filter can operate full time, and you need only connect a frequency counter as desired to read the subaudibles that might be present in the signal of interest. Let me know if you would like to see an article on other neat things that can be done with the output of the Low Pass Filter, such as a "tone decoder" circuit to "intelligently" do one thing when a certain tone is present and something else when that tone is not present.

Radio Direction-Finding at Work and Play

Radio direction finding (RDF) has many exciting uses, including helping locate ships in distress at sea, allowing the FCC to search out illegal (pirate) transmitters, and allowing law enforcement personnel to track a wanted criminal via a small hidden transmitter surreptitiously attached to the criminal's vehicle. Using a bug-detector to hunt certain bugging devices is another kind of RDF which often involves highly sophisticated radio equipment.

RDF also comes in handy to track and study wild animals who have been trapped, fitted with a radio-transmitter collar, and released back to their wild habitat. On the other hand, RDF forms the basis for the harmless sport of "fox hunting"—a hidden-transmitter hunting sport enjoyed by ham radio operators worldwide.

Another kind of RDF involves using a receiver with a directional antenna to track down sources of static, noise, or other interfering signals which may be spoiling your radio monitoring; The "transmitter" in these situations is often found to be some malfunctioning electrical appliance or power line which is unintentionally transmitting unwanted signals.

The RDF Loop:

There are various kinds of RDF antennas; the most common is the loop antenna. The directional pattern of a simple loop antenna has two "nulls" or directions of very low responsiveness (fig. 1A). The loopstick antenna found in almost all portable AM broadcast receivers has this bidirectional null pattern. As you rotate such a receiver you will hear a drop in signal strength as you pass through a null in the antenna's response pattern.

With bidirectional nulls it is not possible to determine which of the antenna's two null directions is toward the direction of the received station. However, a loop antenna can be modified to produce only one null by making the loop electrically asymmetrical (fig. 1B and 1C) or by adding a second antenna ("sense antenna"). With one null an unambiguous determination of the direction of the transmitting antenna from the RDF antenna can be made.

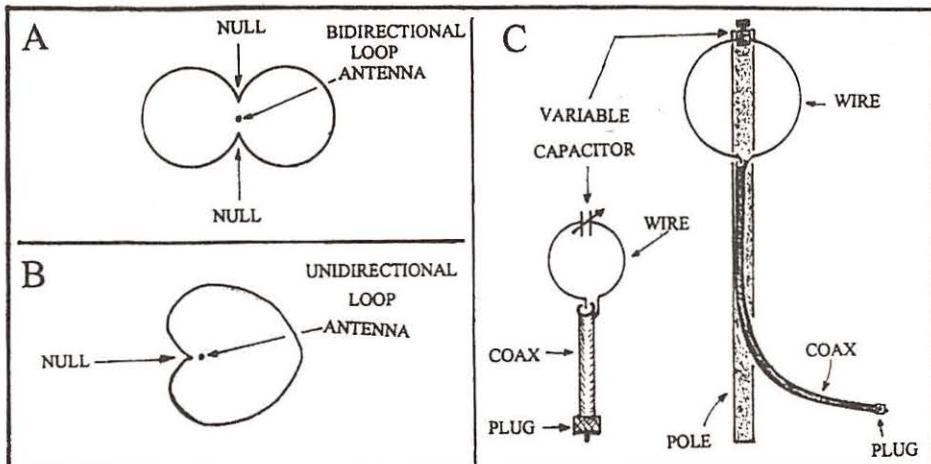


FIG. 1. Directional patterns of a simple loop (A) and a unidirectional loop (B). Schematic and pictorial diagrams are given for the unidirectional loop (C).

Let's Make One:

The completed antenna is shown in fig. 1C.

1. Make a 9-1/4" diameter loop of wire. I used number 12 insulated house-wiring wire, because it is stiff enough to be self-supporting.
2. At the top center of the loop attach a variable capacitor or trimmer capacitor to the pole and solder its terminals to the ends of the wire. A knob attached to the capacitor shaft allows easy retuning of the antenna. I used a capacitor with a maximum value of 70 pf; the frequency range of my antenna is 25 MHz to 57 MHz which covers the CB band as well as the 10-meter and 6-meter ham bands. Larger loop diameters, multiple-turn loops and/or larger values of capacity decrease the maximum and minimum frequency of the antenna's coverage; smaller loop diameters and/or lower capacitance increase its maximum and minimum frequency.
3. At the bottom center of the loop solder one end of the wire to the center conductor of the coaxial feedline; solder the other wire to the coax braid. Tape or otherwise attach the coax to the pole. I used 72-ohm coax, but any impedance should work OK for runs of 15' or less.

Using the Loop:

Because skywave signals often give erroneous RDF indications, this antenna is most useful with local (groundwave) signals. To start out, RDF some stations whose directions you already know, so that you can determine where the null "points" from the antenna. To do this, attach the feedline to your receiver's antenna input, hold the antenna pole upright and tune the receiver to a signal; then peak the signal using the variable capacitor of the loop. Now rotate the pole to turn the antenna through all the compass directions until you determine the direction of lowest signal strength in the antenna's response; this is the null direction.

Keeping the antenna centered on the null, attach a pointer to the antenna pole indicating the known direction of the transmitting antenna which you are RDFing. Now, whenever an antenna's signal is in your antenna's null, the pointer will show the bearing toward the transmitting antenna.

You can pinpoint the location of any unknown transmitting antenna by taking an RDF bearing from two or more widely separated locations and drawing their RDF bearing lines on a map: each line originates at the point on the map from which a bearing was taken, and is drawn in the direction of the RDF bearing. The unknown antenna will be found at the

location indicated by the intersection of the lines.

A Free Transmitter-Hunt Game:

You can have a transmitter hunt without building an RDF antenna or transmitter to hunt! Just take two AM broadcast receivers; turn them on and set them side-by-side. Tune one receiver (hereafter called the "transmitter") carefully across the entire band. If the other receiver (hereafter called the "receiver") is set to an appropriate frequency, it should, at some point as you tune the transmitter, receive a signal (a noise or hum) coming from the transmitter. That signal is coming from a circuit called the "local oscillator" of the transmitter. If you hear no signal in the receiver, then tune it to a different portion of the AM broadcast band and repeat the process just described.

Once you hear a signal from the transmitter, move the receiver away from the transmitter. Rotate the receiver and find a null in its response. Leave the receiver in this position and put a piece of tape on the receiver case with an arrow to indicate the direction toward the transmitter. Turning the receiver 180 degrees should reveal another null. Note how these nulls indicate the direction from the receiver to the transmitter.

Now have someone hide the transmitter in the room. The game is to find it with your knowledge of the antenna's directional nulls. If the signal is quite weak, which it probably will be, you may have to roam around the room just to find the signal at first. For use in this game, the receiver should be battery operated and tuned to the transmitter before the hunt starts. Using several receivers tuned to the transmitter lets you and your friends have a "fox hunt" right in your living room!

By the way, this RDF technique is not limited to fun games; a deadly version is sometimes utilized to locate enemy troops in war. Even when the enemy has a "radio blackout" (all transmitters silent), it is sometimes possible to RDF the signals emitted from the local oscillators of the receivers!

RADIO RIDDLES

Last Month:

Recently our riddles have covered the fact that a single antenna can transmit and receive signals simultaneously. Then last month I asked: "Is it possible, practical, or ever desirable for two or more stations to transmit their signals from one antenna simultaneously?" The answer is "definitely, yes."

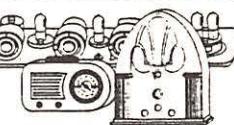
By utilizing appropriate filter circuits in each transmitter's feed to the antenna it is possible to effectively have two or more transmitters transmit from a single antenna. And we'll likely see more of this practice in the future. *Radio World*, a journal for broadcast radio engineers, recently reported that the practice of two or more broadcast stations utilizing a single antenna is likely to increase due to "LMA and duopoly consolidations, the coming expanded AM band, and the overall cutback in AM station operating expenses...."

This Month:

It's hard to RDF skywaves (skip signals) accurately, but we can often get a decent idea of the general direction from which they come. If you were located in the exact center of the United States and were RDFing an HF skip signal which originated on the other side of the world, exactly opposite to your location on the globe, from what compass direction would that signal appear to come?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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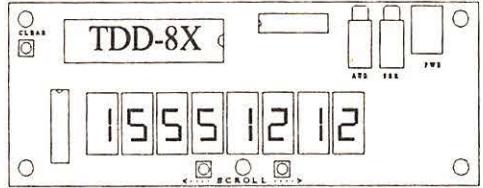
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Q. What are the actual frequencies used in the 500 kHz mediumwave broadcasting band? (Robert Brock, Phoenix, AZ)

A. In the United States, mediumwave AM broadcasters are spaced every 10 kHz from 540 to 1600 kHz. In Europe there are two domestic bands—the gradually-dying 150-350 kHz longwave band, and the 520-1620 kHz medium wave band—all AM, but with 9 kHz channel spacing in the latter range.

On automobile trips, you will occasionally

see road signs suggesting you tune to 530 or 1610 kHz Travelers Information Service (TIS) stations—usually solar/battery powered low-wattage transmitters broadcasting tape loops of traffic, road, and facilities conditions. With the impending expansion of the broadcast band to 1700 kHz, a decision awaits as whether to move the 1610 kHz authorization to 1710 kHz or down to 530 kHz.

Q. I see frequent references to "subaudible tones" used by various agencies. What are these and what

are they used for? (Ken Dooley, Bloomington, IL)

A. It is common for several departments within an agency to use the same radio frequency for communicating. But when police dispatchers have to listen to road crews, and firefighters must put up with chatter from the EMS doing a radio check, the distractions are fatiguing.

Continuous Tone Controlled Squelch System (CTCSS), variously called Private Line or "PL" (Motorola trademark), or more de-

Bob's Tip of the Month

Cellular Restoration for Later-Model BC855XLT

While we have covered previously the cellular restoration on the original Uniden BC855XLT scanner, later models, with the circuit board labeled "PH-120AF," require a different procedure.

Before attempting this procedure, confirm that your model contains the PH-120AF circuit board. You will need a Phillips screwdriver; small needle-nose pliers or tweezers; 10k @ 1/4 or 1/2 watt resistor; desoldering tool or solder wick; and a small soldering iron and rosin core solder to perform the modification.

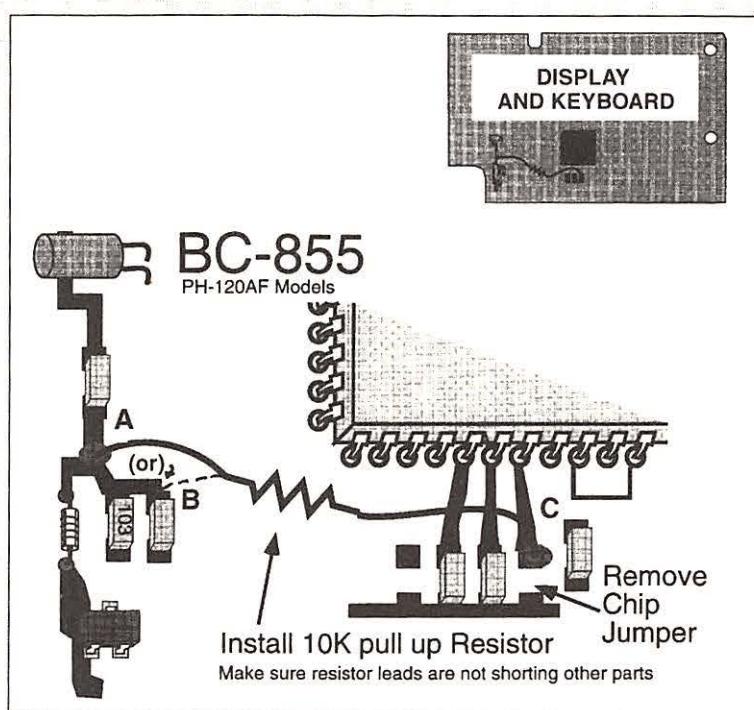
As always, while we have made every attempt to verify the procedure to be described, we assume no liability for personal injury or equipment damage resulting from this project.

(1) Remove the power and antenna from the scanner.

(2) Remove the cabinet screws and open the radio.

(3) Locate the circuit board attached to the top panel and remove the screws holding it down.

(4) Locate the chip jumper shown in the illustration; apply heat from the soldering iron and remove it carefully, using a desoldering tool or solder wick. Save the chip in case you wish to restore the radio to original condition for warranty repair later.



(5) Cut enough lead to route the 10k resistor between points A and C, or alternatively, B and C. Scrape a small area of the green solder mask off point "A," as shown in the diagram, leaving bright copper. Solder one end of the resistor to this point. Alternatively, this lead may be soldered to point "B," the top of the unbleaded chip resistor.

Solder the other resistor to point "C," the upper solder pad from which the chip was previously removed.

Check to be sure the resistor leads don't touch any other components, and that there are no accidental solder bridges or flecks on the board.

This completes the restoration. Reverse steps 1, 2 and 3 to reassemble the radio. Test it by entering a cellular frequency between 869 and 894 MHz. Remember, however, that it is unlawful to monitor any mobile telephone conversations.

We would like to thank Artsci, Inc. of Burbank, California, for contributing this month's hint.

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

scriptively, "sub-audible tone," is a method of generating a low-pitch tone (even lower than speech frequencies) which is transmitted along with the voice. Only those radios equipped with a squelch set for that tone will hear transmissions. (see Bill Cheek project in this month's "Workshop.")

There are dozens of standard tones to choose from, quietening receivers not only from sister agencies sharing the same transmitter, but from other nearby licensees who might be sharing the same frequency.

Q. I live in a condo down in a gully, with overhead power lines close by on all four sides, and I can't put up an outside antenna. How can I improve my shortwave reception? (Neal Wilson, Manchester, CT)

A. You're kidding, right?! I'll bet you're in the same fraternity that sends those prank letters to Ann Landers! But, just in case you're serious and don't want to move or take up a new hobby, here goes.

Fortunately, distant shortwave signals often arrive from high angles ("skywave"), so the gully may not pose a problem. If not the roof, can you access an attic crawl space? Stay away from wires and metal ductwork or metal roofing, and erect anywhere from 20 to 75 feet of wire as high as possible. Near its center, cut it and insert an insulator; connect RG-58/U coax—shield to one side, center conductor to the other—and run the cable to your receiver.

If that is impractical, you may wish to purchase a shortwave amplified loop antenna such as sold by Worldcom Technology (PO Box 3364, Ft. Pierce, FL 34948; ph. 407-466-4640) or Palomar Engineers (Box 462222, Escondido, CA 92046; ph. 619-747-3343). Mounted near an outside wall or window, this system can also help null out power line noise.

Q. Can I improve the selectivity on my receiver by replacing the I.F. filter(s)? If so, where can I get the

filters? (Richard Dailey, Pittsburgh, PA)

A. You can improve the selectivity (adjacent-frequency rejection) of any receiver by substituting narrower-bandwidth filters, but there are several considerations:

What is the optimum bandwidth? Too narrow and you will distort the signal.

Where can you get the filters? They are usually an OEM (original equipment manufacturer) item, not available over the counter unless listed as an option from the receiver vendor.

Who can install them? The characteristics of the original filter must be closely matched, and even schematics aren't always enough.

Contact the dealer from whom you bought the receiver; if he is competent, he can offer you advice.

More on Hearing Shortwave Signals in the Mediumwave Band

In our September column, Jerome Kaye asked how he could be hearing shortwave stations in the medium-wave broadcast band. We pointed out intermod possibilities; Perry F. Crabill, Jr., of Winchester, Virginia, offers yet another possibility.

Simply stated, a receiver mixes its internally-generated oscillator signal with the received signal to produce an intermediate frequency (IF) like 455 kHz which, in turn, is processed (detected) for its audio.

If the oscillator is not properly designed, its harmonics can also mix, producing phantom duplicates of the received signal on various frequencies. For instance, when our example receiver is tuned to 1600 kHz, its oscillator would be on 2055 kHz to produce the 455 kHz IF (2055 minus 1600 equals 455).

If the third harmonic of the oscillator, 6165 kHz, is also present, then an incoming shortwave broadcaster on 5710 kHz will also be heard at that dial setting (6165 minus 5710 equals 455).

To test whether this is the problem, tune the radio slightly in frequency; the harmonic will move faster than the fundamental (original) by an amount equal to its harmonic multiple. For example, if you are listening to a spurious signal ("spur") produced by the third harmonic, the tuning rate will appear three times as fast.

Thanks, Perry.



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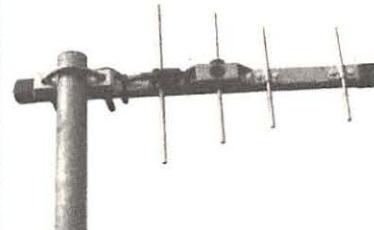
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LETTERS

(Continued from page 4)

Sunrise-Sunset

Will the sun never set on a definitive formula to calculate sunrise and sunset times? We've received four more "solutions." Robert Dehoney of Isle of Palms, SC, provided a 12-line BASIC program to do the calculation as outlined in the formula by Bob Elston in the Sept. Letters. He says, "To avoid a lot of GOSUBs and IF..THENs, I expressed the declination as a function of the (approx) number of days since Dec 21st. The tests I have run show the accuracy to be within 10 minutes."

```

5 ..... CLS
10 ..... PRINT "MONITORING TIMES 9/1994 sunrise/sunset
           calculation"
20 ..... INPUT "Enter west longitude and north latitude, both as
           decimals ",LON,LAT
30 ..... INPUT "Enter day and month (e.g. 28,7) ",D,M
40 ..... PI=3.14159 :L=D+13/3*7*(M-1)+10 :LA-L/365*2*PI
50 ..... 'L is the approx number of days since Dec 21st, (most
           negative declination)
60 ..... A=-PI/180*22.5*COS(LA) ' Calculates approx declination
           in radians
70 ..... X=TAN(A)*TAN(LAT*PI/180) :Y=-ATN(X/SQR(1-
           X*X))+1.5708
80 ..... SR=LON/15+Y/15*180/PI
90 ..... SS=LON/15-Y/15*180/PI :IF SS<0 THEN SS=24+SS
100 ..... PRINT "SUNRISE is at "INT(SR)"hr,""INT((SR-
           INT(SR))*60)"min, UTC"
110 ..... PRINT "SUNSET is at "INT(SS)"hr,"INT((SS-
           INT(SS))*60)"min, UTC"
120 ..... END

```

That's great—the only trouble is, Kenneth Pulliam of Pfafftown, NC, says Bob Elston's formulas on which the above calculations are based are incorrect. He says, "The term ARC-COSINE (of A) means 'the angle whose cosine is,' and thus A must be a number between 0 and 1 and cannot be the angle of declination of the Sun. The first term of the equation is a correction from UTC to local noon (1/15 of an hour per degree of longitude), and so the UTC at the end of the equation is incorrect.

"The second part of the equation is 1/2 the length of the day, which in the original example is computed as 5.78 (but which should be 6.02, found in a book on sundials and confirmed by a log of weather related data kept by my wife). Unfortunately my book on sundials has

lots of tables but no formulas."

H-mm-m, interesting, but where does that leave us? Back at the beginning, says Bill Madson of Jonesboro, Maine. He says the original formulas work just fine. "I use them as I travel the world on a freighter, listening to obscure SW stations."

Well, I'll bet Bob Eldridge, VE7BS, didn't get this much attention with his original article! Here are the formulas as they appeared in 73 magazine in October, 1984.

$$\text{SUNRISE} = \frac{\text{longitude W}}{15} + \frac{\cos^{-1}(\tan a \times \tan \text{latitude N})}{15}$$

$$\text{SUNSET} = \frac{\text{longitude W}}{15} - \frac{\cos^{-1}(\tan a \times \tan \text{latitude N})}{15}$$

a = inclination of Earth's axis to direction of the Sun

Roy Lavender of Long Beach, CA, sums up his opinion: "Fooey on formulas for sunrise and sunset. For those who want the info without the pain, send in the money for Merlin's Calends. The enclosed print screen (see below) is correct for my local airport."

Merlin's Calends is an unusual program for modern druids we've heard recommended before. It costs \$13 (airmail overseas), or 19.95 Dutch Guilders, or 6 Pound Sterling, from Merlin - Silver Circle, P.O. Box 473, 3700 AL Zeist, The Netherlands.

| Date | | Dawn | Rise | Noon | Set | Dusk | Midn |
|--------|------|------|------|-------|-------|-------|-------|
| 31 Aug | 1994 | 4:08 | 4:35 | 11:07 | 17:38 | 18:04 | 23:07 |
| 1 Sep | 1994 | 4:09 | 4:36 | 11:06 | 17:36 | 18:03 | 23:06 |
| 2 Sep | 1994 | 4:10 | 4:37 | 11:06 | 17:35 | 18:01 | 23:06 |
| 3 Sep | 1994 | 4:11 | 4:37 | 11:06 | 17:33 | 18:00 | 23:06 |
| 4 Sep | 1994 | 4:12 | 4:38 | 11:05 | 17:32 | 17:58 | 23:05 |
| 5 Sep | 1994 | 4:12 | 4:39 | 11:05 | 17:30 | 17:57 | 23:05 |
| 6 Sep | 1994 | 4:13 | 4:40 | 11:05 | 17:29 | 17:55 | 23:05 |
| 7 Sep | 1994 | 4:14 | 4:41 | 11:04 | 17:27 | 17:54 | 23:04 |
| 8 Sep | 1994 | 4:15 | 4:42 | 11:04 | 17:25 | 17:52 | 23:04 |
| 9 Sep | 1994 | 4:16 | 4:43 | 11:04 | 17:24 | 17:50 | 23:04 |
| 10 Sep | 1994 | 4:17 | 4:43 | 11:03 | 17:22 | 17:49 | 23:03 |
| 11 Sep | 1994 | 4:18 | 4:44 | 11:03 | 17:21 | 17:47 | 23:03 |
| 12 Sep | 1994 | 4:19 | 4:45 | 11:03 | 17:19 | 17:46 | 23:03 |
| 13 Sep | 1994 | 4:20 | 4:46 | 11:02 | 17:18 | 17:44 | 23:02 |

I'm sure there are many shareware computer programs to calculate sunrise/sunset times for you. Or, you can utilize a simple slide rule that's also been around for a long time—the DX Edge—just recently picked up by the Grove Enterprises catalog. It's obvious, however, that there are some who—like those who like to build their own equipment—like to "figure it out themselves."

Siding with Silver

Linton Robertson stands by the account he gave in August's "Radio Reflections" of McMurdo Silver's career, despite some disagreement from two readers in October. In response to one writer's claims that Silver's radio were built by Howard Radio, Robertson says, "Not all of them! Quoting from *Radio Manufacturers of the 1920s* by ... Alan Douglas, '...in April of 1934 Howard moved back to McMurdo Silver's plant at 1731 Belmont... Silver left Belmont Avenue in June of 1934 but Howard remained there through 1948 making communications receivers, reportedly some of McMurdo Silver's later Masterpieces.'

"Please note that the only sets even in question are the later ones. Howard also provided RCA license coverage to small manufacturers during this period, notably Bill Halligan of Hallicrafters. The fact remains, Silver DID have his own plant, and Howard moved into Silver's plant, not vice versa."

Robertson avers that although Silver receivers went to the Antarctic with Byrd as broadcast receivers (as stated in the article), not for communications, it was an honor nonetheless. The statement that Hallicrafters/Howard put sets together for Scott came from another recognized authority, Don Patterson of *Radio Age* magazine, says Robertson.

Robertson says he could have exaggerated

the height of the Silver cabinet he saw—he just knew that "This thing was BIG." Linton's wife, who stands 4ft. 11 in., "says upon reflection that she's sure it was at least as tall as she is."

As I said last month, "De Bate Goes On" ...

Good Home for Used Equipment

Ronald Fine is a volunteer who works with a community of mentally challenged adults called Orchard Village in Skokie, Illinois. Within this community of about 200, residents learn job and living skills with the goal of becoming self-sufficient. Mr. Fine teaches them amateur and shortwave radio. "We also

(Continued on page 115)

These special test broadcasts provide a unique opportunity to hear and identify the following stations. If you hear their broadcasts, please let the engineer know at the address provided. More information on DXing the broadcast band can be found in *DX Monitor*, the publication of the International Radio Club of America (IRCA, P.O. Box 1831, Perris, CA 92572-1831, USA) and *DX News*, the publication of the National Radio Club (NRC, P.O. Box 5711, Topeka, KS 66605-0711). Both clubs are devoted to the hobby of hearing distant stations on the standard AM and FM broadcast bands. For a sample of either publication, send one 29 cent stamp (\$1 US or 1 IRC overseas) to the addresses above. The following tests were arranged by J.D. Stephens for IRCA.

November 1-30 - CJSB-540, 1504 Merivale Road, Ottawa, ON K2E 6Z5, Canada, will conduct a DX test every day and night during the month of November. CJSB will insert Morse code IDs during their regular rock format programming, and this will run 24 hours per day. This will run until CJSB leaves the air, which according to CJSB's engineer, will be mid-December. Reception reports may be sent to: Mr. Jeff Ruck, Chief Engineer.

Monday, Nov 7 - WVLD-1450, 1000 West Gordon St, Valdosta, GA 31601, will conduct a DX test between 12 & 5 am EST. The test will include Morse code, test tones, and voice IDs. Reception reports may be sent to Mr. Tom Moog, Chief Engineer.

Monday Nov 7 - KYCA-1490, 600-6th St, Prescott, AZ 86301, will conduct a DX test between 2:30 & 3 am EST. The test will include Morse code, test tones, and voice IDs. Reception reports may be sent to: Mr. Al Hartzell (N7UKQ) Chief Engineer.

Monday Nov 14 - WGNY-1200, P.O. Box 2307, Newburgh, NY 12550, will conduct a DX test between 12 & 12:30 am EST. The test will include test tones and Morse code IDs. Reception power will be 10 kW using a non-directional antenna pattern. Reports may be sent to Mr. Shawn C. McGrath, Operations Engineer.

Monday Nov 21 - KDDD-800, P.O. Box 555, Dumas, TX 79029, will conduct a DX test between 1:30 & 2 am EST. The test will include test tones and Morse code IDs. Reception reports may be sent to Mr. Granville Murphy (W5OVD) Chief Engineer.

Monday Nov 21 - WFRM-600, Box 309, Coudersport, PA 16915, will conduct a special DX test between 2 & 2:30 am EST. The test will include march music, Voice IDs, and Morse code IDs. This test will be simulcast on *WTRN-1340* (Tyrone), *WFRM-FM 96.7* (Coudersport), and *WGMR-FM 101.1* (Tyrone). Special thanks to WFRM/WTRN General Manager and IRCA member Cary Simpson for his help in arranging this test. Reception reports may be sent to Mr. Robert Lynn, Chief Engineer.

Monday Nov 28 - CJGX-940, 120 Smith St East, 4th Floor, Yorkton, SK, S3N 3V3, Canada, will conduct a DX test between 1 & 1:30 am EST. The test will include test tones, voice IDs, Morse code ID, and country music. Power will be 10 kW using a nondirectional antenna pattern. Reception reports may be sent to Mr. Kelly Osmak, Chief Engineer.

Monday Nov. 28 - WMAM-570, P.O. Box 609, Marinette, WI 54143, will conduct a DX test between 1 & 1:30 am EST. The test will include test tones, voice IDs, and Morse code IDs. Reception reports may be sent to Mr. Dave Scott, Operations Manager.

Monday Nov 28 - WVKO-1580, 4401 Carriage Hill Lane, Columbus, OH 43220, will conduct a DX test between 1:30 & 2 am EST. The test will include Morse code IDs and urban contemporary music. Reception reports may be sent to Mr. John Marocchi, Chief Engineer.

(Continued from page 114)

discuss satellites, as well as other facets of electronics. We have an old Hallicrafters SR150 SSB transceiver on the air as a club station as well as other very old pieces of donated equipment. When equipment becomes inoperative my residents (which total 19) become very sad and you can see it in their eyes, but when it's working, they have a 'ball.'

Considering that my project cannot get federal or state funding we look for donations. If anyone wants to donate equipment, we will supply them with a tax letter. My group has recently taken an interest in aircraft radio, but has nothing to listen to except my personal pocket scanner. Another thing we are looking for is a portable frequency counter, because the Hallicrafters easily goes out of band."

If you can help in this worthy project, write or call Ronald Fine at 7917 N. Luna Ave., Morton Grove, IL 60053; (708) 966-4912.

From the Editor

After receiving two separate reports of a rumor that the center shortwave guide is being discontinued in *Monitoring Times*, I wish to set the record straight: at no time have we ever considered discontinuing the "English Language Shortwave Guide"! I can only assume that someone misunderstood the reference to the *quarterly* guide to Radio Programs—which appears on page 47 and is a



"Where's my Grove SP-200 Sound Enhancer—Isn't Grove shipping?"
You bet your bippy we are, says Angie, as she packs up another production run. It's just hard to keep up with demand on this popular product!

half-page list of programs about radio (DX programs)—as meaning the entire 28-page section was becoming quarterly.

The transition between summer and winter scheduling, and from Daylight Savings to Standard Time, presents a challenge for any radio publication. Our monitoring team does a great job of producing an accurate guide through the use of advance printed and over-the-air station schedules whenever available. These schedules can then be verified in later issues of the magazine. Why not join in the team effort, by giving the *MT* monitoring team the benefit of your monitoring times?

Rachel Baughn, Editor

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All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. \$18 US, \$21 Can/Mex, \$28 ww. \$3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine. *SWL*. \$20 US, \$22 Can/Mex. \$1 sample (\$2 ww). Meets 1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* \$18 US, \$19 Can/Mex, \$25 ww.

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd., Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*. \$19 US, \$29 Can/Mex, \$22 ww. \$1 or 5 IRC's sample.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. \$2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. \$25 US, \$2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). \$17.50 or \$29.90, \$5 more Can. \$3 sample.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fri 7:30pm, Bull Billerica Facility, 300 Concord Rd., Billerica.

British Columbia Shortwave Listening Club (BCDX): Box 500, 2245 Eton St., Vancouver, BC Canada V5L 1C9, (604) 255-8987 fax. Shortwave. *LOGJAM*. Meets 3rd Thurs. 7pm at 920 Davie St.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park, Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*. \$26 Can, \$25 US, \$US28 or \$Can35 ww. \$2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. \$8. Meets irregularly.

Central Florida Listeners Group: David Grubbs

N4EF, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407) 296-2055 Andy Fountain, Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF, SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. \$17, \$1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington NONNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Longwave, shortwave. *Colorado Shortwave Listener* (4x) 35 cents each. Meets 1st Sundays.

Communications Research Group: Scott Miller, 122, Greenbrier Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908)591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania*. \$10 US, \$11 Can/Mex, \$16 Eur, \$17.50 Asia/Pac.

Drake SPR4 Int'l Club: Bill Swiger, Route 1, Box 142A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpage@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35126-1176. Worldwide; all bands. *Radio Waves* (bi-monthly). \$1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831. Worldwide; BCB/AM DX. *DX Monitor* (34 x) \$25 US, \$27 Can/Mex, \$28.50 ww. \$.29 or 2 IRCs sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown*. \$18 US, \$19 Can/Mex, \$26 ww.

Listeners' Nets

You are invited to post your amateur radio net in this bi-monthly listing if its primary emphasis is devoted to the radio monitoring hobby (not amateur radio).

Capitol Hill Monitors

146.91 MHz 1st & 3rd Mon 7:30pm ET, DC, Md, N.Va, S.Del; Scanning and amateur radio Frequency Forum BBS 703-207-9622 [8-N-1]

Net Mgr: N3RDC, John Korman

Call Alan Henney 301-270-2531 or John Korman 301-299-5455 for info

Newsletter #8; 6912 Prince George's Ave, Takoma Park, MD 20912-5414

Central Florida Listeners Group

146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands

Net Mgr: N4EF

Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031

Call Mark Kuziv, KC4ZVK, 407-933-7163 for info

Larkfield's ARC SW-Scanner Net

147.210 MHz, Fri 8pm ET, Long Island, NYC, NJ, Conn; Shortwave BCers & utes, MW, amateur radio, scanning

Net Mgr: Hank Lukas, N2GCN

Open to all amateurs on air; by letter for scanner listeners

Contact: P.O.Box 115, Plainview, NY 11803-0115

Montreal DX Listeners Net

146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner

Net Mgr: Sheldon Harvey VE2SHW

Telephone gateways announced

Monitoring the Long Island Sounds Net

146.805 Tues 8pm ET, Long Island, NY; Primarily scanning

Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net

146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band

Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls)

Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association

146.880 Mon 9pm ET, NYC area; "DC to Light"

Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736 Voice mail 1/2 hr before net: 212-978-3375; Compuserve 73167,312

Northeast SW Listeners and Scanners Net

Rip Van Winkle Society

147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.

Net Mgr: Ray Looper N2RAD

Rocky Mountain Monitoring Net

147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring

Brian Gould, KB0MEP, Mt. News Net

Scanner and Shortwave Listeners Net; AOSC

146.940 Mon 9:30pm ET, SW Ohio; Scanning, SW, AM-FM-TV DX

Net Mgr: N8OAY

Open to licensed amateurs; no phone or mail gateways

Shortwave Listeners Net, Association of North American Radio Clubs

7.240 MHz LSB, Sun 10am ET, Eastern US;

Shortwave broadcasts and utilities

Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446

Telephone gateways announced

Southern Wisconsin SW Listeners Net; MARA

147.150 MHz, alt 146.760 MHz, Madison, WI, area

First Sun 8pm CT. Shortwave, scanning, dc to daylight, equipment notes and comments.

Net Mgrs: N9LTD, KA9SRU, N9EWO

Contact: N9EWO, Dave Zantow, 1609 Ontario Drive, Janesville, WI 53545

SPECIAL EVENT CALENDAR

| Date | Location | Club/Contact Person |
|-----------|----------------|---|
| Nov 5 | Eustis FL | Lake Co ARA / Steve Eshom, AC4KN, PO Box 216, Zellwood, FL 32798 (904) 345-5414 |
| Nov 5-6 | Stone Mt, GA | Hamfest & Computer Expo, Alford Memorial Radio Club / P.O. Box 1282, Stone Mt. GA 30085-1282. Location: Gwinnett Co Fairgrounds, Lawrenceville. Sat 9-5; Sun 9-3:30. Talk-in 146.16/76, PL tone if on 107.2. \$8 gen admission. RV hook-ups. |
| Nov 5-6 | Odessa, TX | West Texas ARC / Robt Jordan N5RKN, 1521 E 13th, Odessa, TX 79761 (915) 335-7980 |
| Nov 6 | Southfield, MI | Oak Park ARC / Andy Penn, 28771 Fairfax, Southfield, MI 48076 (810) 559-0147 |
| Nov 12 | Montgomery, AL | Montgomery ARC / Huey Fourquet KB1RH, 517 Deerfield Dr, Montgomery, AL 36109 (205) 416-4882 |
| Nov 12 | Plymouth, MA | Mayflower ARC / Jim Ford NM1F, 194 Rocky Hill Rd, Plymouth, MA 02360 (508) 747-2224 |
| Nov 12 | W. Monroe, LA | Twin City Ham Club / P.O. Box 1871, W. Monroe, LA 71294-1871, Lynn Tiller (318) 322-3129. Location: West Monroe Convention Center |
| Nov 12 | Myrtle Bch, SC | Beachfest Hamfest and Computer Show, Grand Strand ARC / P.O. Box 2135, Myrtle Beach, SC 29578-2135. Robert Battle (803-236-2887) or Gordon Mooneyhan (803-293-3839). Location: Myrtle Beach High School. 9am-4pm. \$6 gen admission. Talk-in 147.120(+) |
| Nov 19-20 | Ft. Wayne, IN | Allen Co Amateur Radio Technical Society / ACARTS, P.O. Box 10342, Fort Wayne, IN 46851, Don Gagnon (219-484-3317). Location: Allen Co War Memorial Coliseum Exposition Center. Sat 9-4; Sun 9-3. \$5 general admission. Talk-in 146.88(-) |
| Nov 19-20 | Tampa, FL | Suncoast Convention / Fla Gulf Coast ARC, P.O. Box 2423, Clearwater, FL 34617-2423. Charlotte Frazier (813) 733-6937. Location: Florida Expo Park Expo Hall, 9am-5pm Sat, 9am-3pm Sun. |
| Nov 19 | Macomb, IL | LaMoine Emergency ARC / Don Johnson KA9SQB, 702 Washington, Macomb, IL 61455-2023. Location: Grand Ballroom, Western Illinois Univ. Student Union. 8am-3pm. |
| Nov 19 | Socorro, NM | Socorro ARA, Tech ARA / David Finley N1IRZ, 1202 Ladera, Socorro, NM 87801 (505) 835-1218 Location: Finley Gym, 9am-5pm. Talk-in 146.68 (-) Free admission. |
| Nov 20 | Benson, NC | Johnston ARS / William Lambert AK4H, 8917 NC Hwy 50N, Benson, NC 27504 (919) 894-3352 |
| Nov 26 | Evansville, IN | EARS / Martin Hensley, 1506 S. Parker Dr, Evansville, IN 47714 (812) 479-5741 |
| Nov 26 | Litchfield, IL | Central Illinois/St Louis Area ATV Club / Scott Millick K9SM, 907 Big Four, Hillsboro, IL 62049 (217) 532-3837 |
| Nov 26 | Chalmette, LA | New Orleans VHF ARC / Duncan McCarthy N5NBI, 2537 Prancer St, New Orleans, LA 70131-5127 (504) 361-2171 |
| Dec 2-3 | Dothan, AL | Wiregrass ARC / Walter Haymon WA6MWS, 266 Ashley Circle, Dothan, AL 36301 (205) 793-3978 |
| Dec 3 | Mesa, AZ | Superstition ARC / Joe Bonfante WA6MVW, 1432 N. 67th St, Mesa AZ 85205 (602) 832-6594 |
| Dec 3 | Minden, LA | Minden ARA / Geo Winford AA5OL, 111 Fuller St, Minden, LA 71055-3420 (318) 377-5019 |
| Dec 3 | N. Olmsted, OH | Fall Hamfest / North Coast ARC, P.O. Box 30529, Cleveland, OH 44130, Dan Sarama KB8A (216) 267-5083. Location: St. Clarence Church, 301016 Lorain Rd (between Stearns and Barton). \$4 general admission. Talk-in 145.29, 224.76 rptrs. |
| Dec 3 | Norwich, NY | Chenango Valley ARA / Robt Levin N2KYZ, 25 Hillview Dr, Norwich, NY 13815 (607) 334-9503 |

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar
P.O. Box 98, Brasstown, NC 28902-0098

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FOR SALE: BEARCAT BC200XLT w/cellular. \$205 Shipped. (614)452-3209.

Kenwood R-5000 with voice synthesizer, RDI white paper, mod/review book, manual, service manual, and SP-430 external speaker \$700. Bob Lusby, (317)477-1280.

BEARCAT BC800XLT \$190. BC100XLT \$130. \$300 for both. Mint Condition, Original boxes. (603)226-0841.

Wanted: information/service to speed up the scan rate on my AOR1000XLT. Charles Braseth, 106 Reeves Court, Grand Forks, ND 58201, (701)746-8792.

For Sale: Satellite Subcarrier Receiver. New-2-channel, for GOES-TAP, \$150. Bill, (203)288-4477.

DIAMOND D-130J scanner antenna used 1 day, \$65. ANTRON-99, 11 meters (10-40 m. also), \$50. Call Marino (203)877-1173.

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Signaling Our Punches in Haiti!

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Shortwave listeners were astounded. The President had openly announced the impending invasion of Haiti to restore the democratically-elected government, and clear-voice U.S. Navy communications came up on special frequencies assigned to the mission (see this month's Utility World).

With no attempt to encrypt the contents, messages constantly updated vessel positions and bearings; lists of callsigns were repeated with their cross-referenced callsigns on other channels; vessels were openly identified by their commissioned names rather than customary trigraphs; frequencies and locations were passed without code names; names of officers were given, as well as special-purpose attachments; frequencies were maintained without change, 'round the clock, for weeks at a time and, at this writing, are still in use.

For utilities listeners it was a godsend—fascinating monitoring quarry that had not been heard for a decade or more. No scrambling, no channel-switching hopscotch, no bewildering code names, just good old English.

So why did they do it? The military has in place untold wealth of encryp-

tion equipment; NSA computer-generates callsigns on a mission-by-mission basis, often every 24 hours; voice scrambling is already in place on all Navy vessels.

It has been suggested that the radio operators simply weren't aware of the magnitude of monitoring which goes on; maybe they were concerned for radio incompatibility among the multinational forces mustering for the invasion; or was what we heard so low level that other, more urgent, communications were being conducted by secure satellite?

Perhaps the answer is as simple as this: They either didn't care, or they were inviting active listening. After all, it was most desirable that the Haitian junta parliament be abandoned by intimidation, not by violent confrontation. As part of psychological warfare, active listening would reveal to the military officers the extent of firepower speeding toward Port Haitien.

Regardless of the reason for such open communication, it was a boon to radio hobbyists. Not in recent history has there been so much military action in the clear. Will this openness portend of things to come? Probably not. But it was fun while it lasted.



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